THE IRON TRADE REVIEW

VOLUME XXXVIII CLEVELAND, OHIO, JUNE 22, 1095 NUMBER 25

ALL RAIL MILLS

OF THE STEEL CORPORATION WILL SOON BE IN OPERATION.

Jobbers Doing Heavy Business, Especially in Structural Material.

Owing to the heavy orders for rails placed recently, the rail mill of the Ohio works at Youngstown of the Carnegie Steel Co. will resume operations July 1 after being idle more than a year. With this mill in operation, the steel corporation will have all its rail mills on for the first time in more than a year. Present estimates place the total year's tonnage of rails at 2,000,000, which is considerably in excess of the estimates earlier in the year, and if the buying movement should continue during the next few months as during the last two, the year's total will exceed last year's output, 2,283,840 tons, of which 2,137,957 was Bessemer steel rails and 145,883 open-hearth.

Success of Open Hearth Rails

The Tennessee Coal, Iron & R. R. Co. has for some time had sufficient tonnage on its books to insure operation throughout the year and some orders for 1906 were booked by that company several months ago. The success of its open-hearth rail is being emphasized by the fact that the company has very recently taken orders for a considerable additional tonnage for 1906 delivery. The Youngstown mill is now operating on billets and sheet bars and later rails and billets will be rolled. The consumption of steel will therefore be greatly increased as well as pig iron. The idle Bessemer plant at New Castle is scheduled to resume shortly after the first of next month.

Jobbers are Very Busy

Jobbers are doing a heavy business, especially in structural material, of which their stock is being rapidly reduced. Although there is still some re-selling of steel bars below 1.50c, Pittsburg, there seems to be no probability that the manufacturers will make concessions to the agricultural interests, which have intimated that 1.40c would be a satisfactory price for new contracts. Specifications on the old contracts, which expire July 1, are coming in rapidly and the contracts will not be extended.

The Pig Iron Situation

Southern pig iron has furnished still further evidence of weakness and $11.75, Birmingham, for No. 2 Foundry, is the ruling price, although some furnaces still ask $12, and a few transactions have been made at $11.50. These low quotations have not brought out much business. In the north, the pig iron market continues stronger than in the south and many furnaces will not sell No. 2 foundry at less than $15, Valley, although with some interests it is possible to shade that price. There has been considerable inquiry this week for all grades of pig iron, showing increased interest in the market and giving reason to expect a buying movement early in July, but whether that buying will be of the hand to mouth kind or will be of large proportions, can not be foretold. Reports from foundries indicate that they are melting their iron about as fast as it is delivered and an occasional rush order shows smallness of stock on hand.

Ten Miles of Steel Ties

In spite of the recent condemnation of steel ties by a prominent railroad official, the Bessemer & Lake Erie R. R. has shown, by placing an order for 2,100 tons, that it has not lost faith in that substitute for wooden ties. This order will provide for ten miles of tracks. The railroads continue to order equipment rather freely.

Activity of Blast Furnaces

Although prices of pig iron sag and the market is dull, no further curtailment of blast furnace capacity is reported. On the other hand, several stacks will soon be blown in. Eastern Pennsylvania blast furnaces are making very large production. Blast furnace operators are not satisfied with present prices of coke and sales are limited. The International Harvester Co. has not yet closed for the 15,000 tons of coke which it expects to buy.

Large Orders for Elevated Road

The demand for plates and shapes is stronger than for any other kind of finished material. The American Bridge Co. has obtained the contract for 24,000 tons of steel for the elevated road of the Philadelphia Rapid Transit Co., and an order for 3,000 tons for the Claflin building in New York. Orders for 75,000 tons of structural material are soon to be placed in New York.

Not Troubled by the Strike

The statement made two weeks ago in this column that the teamsters' strike in Chicago had resulted in a congestion of iron and steel stocks has been found, upon careful investigation, to be incorrect. Jobbers are not having and have not had any trouble on account of the strike. The iron and steel business in that city has been peculiarly fortunate in escaping the annoyances which have been serious to some other interests.

Sheet and Tin Plate Scales

The representatives of the Amalgamated Association and of independent manufacturers of sheets and tin plates are considering the sheet and tin plate scales of wages, but it is not probable that the questions at issue will be settled without some delay.

THE WEEK IN IRON CENTERS.

PITTSBURG.

In Heavier Lines Mills are far Behind—Large Rail Business.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, June 20.

On July 1 the rail mill at the Ohio works of the Carnegie Steel Co., Youngstown, O., will resume operations after more than a year's idleness. Inasmuch as the Edgar Thomson and Illinois mills are behind on their rail orders, and owing to the tremendous increase in tonnage in the past six weeks, it is necessary to operate the Youngstown mill in full during the summer months at least and from present indications there will be sufficient business to insure operations until November.

Outside of the heavier lines there is no change in the general situation. New business in sheets, steel bars, tin plate and wire continues light and there is little buying of pig iron. In the heavier lines the mills are almost as far behind on their orders as they were during the boom years and the large number of inquiries in the market do not indicate any cessation in the buying movement.

Merchant furnaces in the Valleys as well as in the South are stocking iron, and it is estimated that the stocks in the South now aggregate 150,000 tons. One large producer alone is carrying about 100,000 tons and on a large tonnage little difficulty would be experienced in doing $11.75 Birmingham for No. 2.

Today the independent sheet and tin plate manufacturers are meeting with the Amalgamated Association, but it is doubtful whether any agreement will be reached until after the conference with the American Sheet & Tin Plate Co. is held. No date has yet been fixed for holding the latter, although it is believed that it will be held some time next week.

Pig Iron.—In the Valleys practically all the merchant furnaces are piling iron, and the Bessemer producers are not pushing sales on the present market. Small lots of Bessemer have been sold as low as $14.75 furnace, while forge iron is down to $14.25 to $14.40. Few furnaces are willing to sell No. 2 Foundry below $15 furnace, but this can be shaded nevertheless. Despite the large stocks of iron in the South, that market is being fairly well held, and producers do not believe that they will have to go much lower before the next buying movement sets in. There have been no additions to the idle list of furnaces in the past week and none of the stacks in operation are preparing to go out. We revise quotations as follows:

Bessemer, Valley	$14 75 to 15 00
Bessemer, Pittsburg	15 60 to 15 85
No. 1 Foundry	16 25 to 16 50
No. 2 Foundry	15 60 to 15 75
Gray Forge, Pittsburg	15 15 to 15 25
Basic, Valley	14 75 to 15 00
Basic, Pittsburg	15 60 to 15 85

Billets.—The pressure to sell billets on the part of some of the large producers is not as great as it was several weeks ago, and the curtailment of sheet bar capacity has also strengthened that market. We quote Bessemer billets at $23 to $23.50 and open-hearth $24 to $24.50. Sheet bars are held at $25 to $26. Bessemer and open-hearth rods are quiet at $33 to $34.

Ferro-Manganese.—The market is quiet and prices are not advancing as rapidly as expected some months ago. We note the sale of several carload lots at $50 Pittsburg.

Muck Bar.—No large sales have been reported during the week, and neutral bars are held nominally at $27.40 Pittsburg.

Skelp.—The market continues quiet and we quote grooved steel at 1.50c and sheared 1.55c to 1.60c. Grooved iron is quoted at 1.60c and sheared 1.65c to 1.70c.

Rails and Track Material.—Recent heavy rail orders have so crowded the Lorain, Illinois and Edgar Thomson plants of the steel corporation that it is necessary to place the Ohio works on rails in July. The new light rail mill which the Carnegie Steel Co. is building at Braddock will be placed in operation early in October. This mill will roll 8 to 30-lb. sections from both billets and rail seconds. We make the following quotations: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $25 to $25.50; 20 lb., $24 to $24.50; 25 to 45 lb., $22 to $22.50; angle bars for standard sections, 1.25c; spikes, 1.70c.

Plates.—On open-hearth plates, local mills are filled almost to the end of the year. On Bessemer tank shipments are a little further deferred, but can be made in from five to six weeks. We quote: Tank plates, 1¼ in. thick 6¼ in. to 14 in., inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in. width, not less than 5c per lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except the Pacific Coast.

Structural Material.—The pressure on structural mills continues great and new orders that are now being booked cannot be delivered in less than three to four months. Quotations are unchanged as follows: Beams and channels up to 15 in., 1.60c; over 15 in., 1.70c; angles, 3 x 2 up to 6 x 6, 1.60c; zees, 1.50c; tees, 1.65c; angles, from 3 to 16 in., 1.60c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c base.

Sheets.—Demand for sheets continues light and several plants have become idle during the week. A large portion of the present capacity will be idle on July 1, as the new business that is being placed is not large enough to insure operations of the country's total capacity. We quote: No. 30, 2.70c; No. 29, 2.60c; No. 28, 2.30c; No. 27, 2.20c; Nos. 25-26, 2.20c; Nos. 23-24, 2.15c; Nos. 18-20, 2.10c; No. 16, 2.10c; Nos. 12-14, 2.05c; No. 9, 2c; No. 8, 1.95c; Galvanized, No. 30, 4.30c; No. 29, 3.80c; No. 28, 3.40c; No. 27, 3.20c; Nos. 25-26, 3c; Nos. 23-24, 2.80c; Nos. 18-20, 2.65c; No. 16, 2.50c.

Bars.—New business in steel bars continues light, but speculations are heavy enough to insure the full operation of the mills in this district. Railroad specifications for iron bars are heavy and the market is being fairly well maintained. We make the following quotations: Bar iron, 1.55c to 1.60c, Pittsburg; hoops 1.65c, and bands, 1.50c, both taking hoops and band extras respectively. Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, $1.50c, net; channels, angles, zees and tees, under 3 in., 1.65c. The following differentials are maintained on steel: Less than 200 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Merchant Steel.—Inquiry for merchant steel is heavy and with the small stocks that jobbers are carrying the indications are that the buying movement shortly after the middle of the year will be heavy. Quotations are un-

changed as follows: Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Pipes and Tubes.—Demand for merchant pipe continues fair, but the independent mills are still shading the quotations of the leading producer. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	67	51	65	49
⅜ to 6 inches	75	65	73½	63½
⅜ and ½ inch	71	59	69	57
7 to 12 inches	70	55	68½	53
Extra Strong Plain Ends.				
⅛ to ¾ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong plain ends, ½ to 8 inches	56	45	54	42

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inches	44	41
1 ¾ to 2½ inches	56	41
2½ inches	58	46
2¾ to 5 inches	64	53
6 to 13 inches	56	41

Less than carloads 2 points less.

Wire and Wire Nails.—Demand for wire products is not heavy and jobbers are not placing orders for future delivery. Wire and wire nail production has been slightly curtailed and the indications are that it will be further curtailed within the next two weeks. We quote: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2, and less than carloads, $2.10, with 30c for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron and steel cut nails, $1.70 to $1.75.

Old Material.—There is considerable more inquiry for heavy melting stock and some of the local mills are willing to dispose of their accumulations at $14 to $14.50. Otherwise the market continues quiet. We revise quotations on gross tons, as follows: Heavy melting stock, $14 to $14.50; No. 1 wrought, $14.50 to $15; re-rolling rails, $14; bundled sheet scrap, $12 to $12.50; busheling scrap, $12 to $12.25; turnings, $9 to $9.25, and cast scrap, $13 to $13.25.

Coke.—The deadlock between furnace operators and the coke producers for second half requirements continues and there is little hurry to cover. Connellsville producers are not willing to shade $2.10 for delivery through the last half, while the furnace operators believe that they should secure their coke at considerably less than $2. Foundry coke is selling at $2.35 to $2.40. The organization of the Southern Connellsville Coke Co. is of interest, as this new company takes over the Riverview property. About 250 additional ovens will be built and the plant will be improved by the installation of a washer and crusher. During the week ending June 10, the production of the upper Connellsville region amounted to 267,190 tons, while the lower region produced 82,500 tons.

CHICAGO.

Revival of Inquiry Indicating Approach of a Buying Movement.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, June 20.

As the time approaches when the contracting season for the last half opens, interest in iron and steel prices and conditions grows. During the week past, there has been a marked revival of inquiry from western consumers, which has given rise to the belief that there will be an early buying movement this summer for wants in the next six months. There continues to be considerable irregularity in prices of pig iron and of several finished products. Southern No. 2 Foundry is nominally quoted at $12 Birmingham, though it is possible to buy for spot delivery at 25 cents a ton below this price. This concession is also made on Northern irons, making the local price for these for quick shipment $16.25, or $16 f. o. b. furnace for No. 2. The only perceptible change in finished materials is weakness in wire rods. Up to within the last few days, these have been offered at $34 Pittsburg, but can now be bought at $33. Sheets continue ragged, especially galvanized, the official prices being shaded from $1 to $2 a ton by independent makers. There is an excellent demand for standard rails, the volume of business booked being regulated only by the ability of mills to make deliveries. The Republic Iron and Steel Co. has shared generously in the tonnage closed in the week under review, and is having no difficulty in getting $28 Youngstown. Bar iron grows stronger in sentiment each week, and prices are held firmly in this market at from 1.50c to 1.55c according to the tonnage and delivery required. Specifications for steel bars are active, considerable inquiry having also been felt on requirements for the last half. Billets are firm and premiums are still obtained by local sellers for quick deliveries. The demand for plates, structural steel, pipe, etc., shows no diminution, specifications being continually to the full capacity of mills. Scrap is gradually gaining strength, and while there is little movement, quotations are firmer than they have been for several weeks.

Pig Iron.—This is by no means an inactive market, despite the fact that prices are slowly, but irresistibly, seeking lower levels. Usually, under such conditions as prevail at the present time, there is a noticeable dearth of inquiries, but in this instance, melters in and out of Chicago seem anxious to sound the bottom of the market and are bombarding sellers with offers and requests for figures on their wants in the last half. All this points to one conclusion—that the great majority of western foundrymen will be in the market shortly for iron. Since the second quarter, the consumption of iron has steadily increased, and today there are few, if any, foundries in this district that are not filled up with work or that are not melting their iron as rapidly as it is delivered. The present weakness is not expected to last long. Once the bottom is touched, sellers are sanguine that prices will quickly rebound to their former level under the heavy buying movement that is looked for. Nominal quotations of Northern and Southern irons are about as they were a week ago. Local No. 2 Foundry is offered at $16.50 Chicago and Southern No. 2 at $12 Birmingham, or $15.65 Chicago. If the buyer, however, is willing to take spot delivery, he can shade these prices 25 cents a ton, and possibly, if the tonnage is large enough, he can get a concession of 50 cents a ton. But there is no disposition on the part of furnaces to make long time contracts at less than the foregoing prices. There were several good sized orders closed last week, including the Pullman Co's. inquiry for 2,400 tons, and that of the Moline Plow Co. for an equal amount. We have revised our prices, and quote as follows:

Lake Superior charcoal	$17 00 to 17 25
Northern Foundry No. 1	16 75 to 17 00
Northern Foundry No. 2	16 25 to 16 50
Northern Foundry No. 3	15 75 to 16 00
Northern Scotch Foundry	17 00 to 17 25
Ohio Strong Softeners No. 1	17 30
Ohio Strong Softeners No. 2	16 80
Southern Foundry No. 1	15 90 to 16 15
Southern Foundry No. 2	15 40 to 15 65
Southern Foundry No. 3	14 90 to 15 15

Southern Foundry No. 4	14 65 to 14 90
Southern No. 1 Soft	15 90 to 16 15
Southern No. 2 Soft	15 40 to 15 65
Southern Gray Forge	14 40 to 14 65
Southern Mottled	14 15 to 14 40
Southern Silveries (4% to 6% Silicon)	17 15 to 17 65
Jackson Co. Silveries (6% to 8% Silicon)	20 30 to 21 30
Jackson Co. Silveries (8% to 10% Silicon)	21 30 to 22 30
Alabama and Georgia Car Wheel	20 65
Malleable Bessemer	16 25 to 16 50
Basic Iron	15 90 to 16 15

Billets.—Demand for billets in this market is limited to small lots for forging purposes, for which local sellers are able to obtain premiums over current prices. Wire rods are quiet and prices off about $1 a ton. We quote open-hearth billets, axle or forging, $31 to $32 Chicago; Bessemer or open-hearth, rerolling, $26; wire rods, $33 Pittsburg; chain rods, $34 Pittsburg.

Bars.—Specifications for steel bars grow in volume as the date of expiration of existing contracts approaches. No consumer will be allowed to extend his deliveries on these contracts into the last half, and inasmuch as most of them were made on the basis of 1.30c Pittsburg, consumers are placing in stock as large a tonnage as their warehouses will hold. Some inquiry has been felt for wants in the last half, but it is not expected that any contracting will be done before August, as implement manufacturers generally take inventory in July. Bar iron is in stronger health than it has been for several weeks, and while transactions are of a limited nature, prices are held firmly by local sellers at 1.50c to 1.55c. Other quotations are as follows: On carload lots, mill shipments, Chicago delivery: Bessemer and open-hearth bars and bands, 1.66½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.81½c base, full extras. Store trade is active and prices are firm. We quote bar iron, 1.90c base, full extras; soft steel bars and bands, 1.85c to 1.95c base, full extras; soft steel angles, channels and tees, under 3 in., 1.95c to 2.05c; hoops, 2.20c base, full extras.

Sheets.—Demand is of good proportions, but prices are very ragged. The cutting is felt mostly on galvanized sheets, the official prices of the leading producer being shaded from $1 to $2 a ton by independent makers. These interests are also shading prices on box annealed sheets, though not to the same extent as on galvanized. We quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.81½c; Nos. 11 and 12, 1.86½c; Nos. 13 and 14, 1.91½c; Nos. 15 and 16, 2.01½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.21½c; Nos. 22 and 24, 2.26½c; Nos. 25 and 26, 2.31½c; No. 27, 2.36½c; No. 28, 2.46½c; No. 29, 2.56½c; No. 30, 2.66½c. We quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No 26, 2.70c to 2.75c; No. 27, 2.75c to 2.85c; No. 28, 2.85c to 2.95c; No. 29, 3c to 3.05c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.46½c; No. 16, 2.61½c; Nos. 18 and 20, 2.76½c; Nos. 22 and 24, 2.91½c; No. 26, 3.11½c; No. 27, 3.31½c; No. 28, 3.51½c; No. 29, 3.76½c. Jobbers' prices on lots from store are as follows: Nos. 10 to 14 inclusive, 3.10c; No. 16, 3c; Nos. 18 and 20, 3.10c; Nos. 22 and 24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—The week has been devoid of interest in this product. Specifications are active and to the full capacity of mills. A number of structural contractors whose contracts expire with the end of this month, are making inquiries and preparations towards covering for their requirements in the last half. We quote mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in., inclusive, 1.76½c; angles, 3 to 6 in., ¼ in. and heavier, 1.76½c; angles larger than 6 in., or one or both legs, 1.86½c; beams larger than 15 in., 1.86½c; zees, 3 in. and over, 1.76½c; tees, 3 in. and over, 1.86½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: 2.10c to 2.25c for angles, beams and channels, base sizes, with 2.20c to 2.30c for 18, 20 and 24-in. beams; tees and zees, 2.15c to 2.25c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—Aside from the current volume of specifications, which continue very heavy, the local market is much the same as it was a week ago. We quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6⅛ in. to 100 in., 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extras; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store quotations are as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c; over 72 in. wide up to 100 in., 2.10c; over 100 in. wide, usual mill extras, 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Merchant Pipe.—Demand for merchant pipe continues to improve, the leading interest having received a round tonnage in specifications in the week under review. Some new business has also come forward, though this is not of large volume. The following are prices for carload lots, random lengths, f. o. b. Chicago:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85
PLUGGED AND REAMED.				
	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85
EXTRA STRONG PIPE.				
⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85
DOUBLE EXTRA STRONG PIPE.				
½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—Jobbers report that specifications keep up to their past volume. Some independent mills, however, are suffering from lack of business and are offering attractive discounts to stimulate orders. The leading interest is more than comfortably filled with business, having specifications on its books that will take up its capacity for several weeks to come. We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1¼ inches	40.35	37.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	Up to 4½ inches 50.50
6 to 13 inches	52.35	37.35	

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Rails and Track Supplies.—Heavy sections continue to be in active demand. Independent mills are sharing liberally in the tonnage offered because of their ability to give the desired deliveries. The movement in track supplies and light rails is also very brisk, western mills being kept constantly sold up to the limit of their capacity. We quote heavy sections, in 500-ton lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track sup-

plies, f. o. b. Joliet mill, angle bars, 1.40c to 1.50c; spikes, first quality, 1.75c to 1.80c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—Consumers have been sounding mills freely in the past two weeks on their requirements for the last half. It is expected, as soon as the implement interests have completed their inventory work, which will take practically the whole of next month, that the contracting movement for these wants will commence. Specifications against old orders show no diminution and are continually to the full capacity of mills. Prices are without change and we quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c; smooth finish machinery steel, 1.91½c; smooth finished tire, 1.86c; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21½c. Cold rolled shafting, 50 percent off in carload lots and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards.

Cast Iron Pipe.—The only contract of importance placed with manufacturers in the week under review is that from the town of Belden, Mich., for 1850 tons. Several are pending and more bids are expected to be out in the next few days. Prices have not yet been changed, and we continue to quote carload lots, Chicago delivery, as follows: 4-in., $29; 6-in. and larger, $28; gas pipe, $1 a ton higher.

Wire Products.—Though the summer months are usually dull ones in the wire trade, demand on the leading interest so far has shown no signs of a falling off. Prices are without change, and we quote to jobbers on carload lots, Chicago delivery, as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent to dealers on mixed car lots and 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots.

Coke.—The International Harvester Co. has not yet placed its order for the 15,000 tons of coke for which it has been in the market several weeks, though it is expected the matter will be closed up early next week. The lowest bid that has been made by Connellsville ovens on this tonnage is $2.25 at the ovens, but the company considers this price high and is holding out for a reduction of 25 cents to 35 cents a ton. Owing to the refusal of Connellsville ovens to meet its views, the company is experimenting with by-product and other cokes, and if the results of these tests are satisfactory, these interests will be given the order. Connellsville coke is very strong in this market, local sellers asking on ordinary sized contracts $2.50 at the ovens. It is possible this price might be shaded on spot delivery orders. Virginia and West Virginia brands range from $2.30 to $2.50 at the ovens. Wise County, Va., coke is offered on the same basis as Connellsville, f. o. b. ovens.

Old Material.—The only perceptible change in scrap is a strengthening of values. Trading is of light proportions and is limited to small lots which are offered at attractive prices to move the material. Cast scrap is scarce, and is probably in stronger demand than any other material. Two railroad lists are being figured on, one from the C. M. & St. P., for 1,700 tons, and the other from the C. H. & D. for 850 tons. We have revised several of our prices to meet the changed conditions, and quote gross tons, as follows:

Old steel rails (4 feet and over)	$13 00 to 13 25
Old steel rails (less than 4 feet)	12 50 to 13 00
Old iron rails	17 00 to 17 50
Relaying rails, subject to inspection	22 00 to 22 50
Old wheels	14 00 to 14 50
Heavy melting steel	12 00 to 12 50
Mixed country steel	10 00 to 10 50

The following quotations are for net tons:

No. 1 R. R. wrought	13 50 to 14 00
No. 2 R. R. wrought	12 50 to 13 00
Shafting	15 00 to 15 50
Dealers' forge, No. 1	10 50 to 11 00
Wrought pipe and flues	9 50 to 10 00
No. 1 cast, 150 lb. and less	12 50 to 13 00
No. 1 mill	8 50 to 9 00
No. 1 Busheling	9 50 to 10 00
No. 2 Busheling	8 00 to 8 50
Country sheet	7 00 to 7 50
No. 1 boilers, cut	9 00 to 9 50
Boiler punchings	12 50 to 13 00
Iron car axles	19 00 to 19 50
Steel car axles	14 50 to 15 00
Iron axle turnings	9 50 to 10 00
Cast borings	7 00 to 7 50
Mixed borings, etc.	7 00 to 7 50
Machine shop turnings	9 50 to 10 00
Railroad malleable	12 00 to 12 50
Agricultural malleable	11 00 to 11 50
Stove plate and light cast scrap	9 00 to 9 50
Old iron splice bars	15 50 to 16 00

CINCINNATI.

Inquiries Increase, but the Market is still Dull and Weak.

June 20.

Pig Iron.—The number of inquiries and the interest displayed by buyers of pig iron are steadily increasing. This is but natural to expect as the process of working out contracts continues. Buying has been limited and the few transactions were for moderate quantities to cover current needs. Buyers appear to be eagerly seeking information as to the probable trend of prices and the attitude of the furnace interests. Some of the sales agencies express the view that the long deferred buying movement has actually commenced and that increasing demand may be expected to develop in the very near future. Others believe that buyers will pursue a hand to mouth policy until it becomes apparent that no further shading of prices can reasonably be expected. In the meantime, conditions are unsettled and the market is weak. For southern iron $11.75 Birmingham for No. 2 Foundry as a basis is well established as the ruling quotation, although a few furnaces are still maintaining $12.00. We hear of occasional quotations and there have been some small transactions at $11.50 Birmingham. There have been no large inquiries which would bring out minimum prices, so that there has been nothing during the week which would serve as a positive test as to what the leading furnace interests might quote. The weakness in gray forge continues and $10.00 Birmingham for this grade can be done. A sale of 1,000 tons of basic at $15.00 Detroit is reported. Southern Ohio furnaces are still quoting on the basis of $15.00 at furnace, but the market is regarded as weak at that price. We revise quotations to cover the entire range of prices, but it is fair to say that $11.50 Birmingham on southern iron is exceptional and that $11.75 Birmingham as a single quotation would appropriately represent the market in general. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$14 75 to 15 25
Southern Foundry No. 2	14 25 to 14 75
Southern Foundry No. 3	13 75 to 14 25
Southern Foundry No. 4	13 50 to 14 00
Southern Foundry No. 1, soft	14 75 to 15 25
Southern Foundry No. 2, soft	14 25 to 14 75
Gray Forge	12 75 to 13 25
Northern Foundry No. 1	16 65 to 16 90
Northern Foundry No. 2	16 15 to 16 40
Northern Foundry No. 3	15 65 to 15 90
Southern Charcoal	19 25 to 19 50

Finished Material.—The jobbing demand continues good particularly for structural shapes and some of the structural yards are very low on stock and out of some sizes entirely. There is a moderate demand for steel bars with some few purchases for forward delivery. Bar iron is inactive but unchanged. Bar iron is quoted at 1.55c;

steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 7½ percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of store at 2c for ¼ in. and 2.10c for 3-16, No. 8 and No. 10. Beams and channels are quoted at 2c from stock and angles at 2c to 2.05c for base sizes.

In merchant pipe the market is quiet but steady. An easy undertone prevails, however, and some revision of quotations is expected in some quarters, but as yet there is no positive information and quotations are firmly maintained by the leading interests. We quote f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.35	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Old Material.—The market continues quiet with prices largely nominal in the absence of transactions. Quotations, however, could be shaded on a firm offer. We quote:

Old No. 1 railroad wrought, net tons	$14 00 to 15 00
Cast machine and foundry, net tons	11 00 to 12 00
Old iron rails, gross tons	19 00 to 19 50
Old steel rails, gross tons	15 00 to 15 50
Old short lengths, gross tons	13 50 to 14 00
Old iron axles, net tons	20 00 to 21 00
Stove plate, net tons	8 50 to 9 00
Wrought turnings, net tons	10 00 to 10 50
Cast borings, net tons	7 00 to 7 50
Car wheels, net tons	15 00 to 15 50

Coke.—There is more inquiry and some increase in orders, but no improvement in prices. Foundry coke is quoted at $2.25 to $2.50 and furnace coke $1.75 to $2.00 f. o. b. ovens.

CLEVELAND.

Jobbers Doing a Large Business—More Inquiries for Pig Iron.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, June 21.

Iron Ore.—In spite of unusual fogs which prevailed for several days on the lakes and delayed many vessels, the movement of ore has been heavy and there is no reason for doubting that 5,000,000 tons will be carried this month. There has been some chartering of wild tonnage this week, but owing to the fact that such a large tonnage is under season contracts, there is little interest in the chartering of wild boats. No ore of any large amount is being sold these days.

Pig Iron.—While it is possible that a lower price might be made for a large tonnage, $15 is now the ordinary quotation for No. 2 foundry, and also for basic and Bessemer. We note the sale of 1,000 tons of basic, but no larger sales of any pig iron have been made this week or last. An occasional order for a carload or two from a foundry with request for immediate shipment indicates that at least some melters have little stock on hand. Inquiries are more numerous and show more interest in the market on the part of buyers. Some sellers expect to see a heavy buying movement by July 15, but others anticipate that a hand to mouth policy will prevail for several months. Southern iron is weaker and some sellers are making concessions freely, $11.75 for No. 2 Birmingham being the usual quotation. We quote f. o. b. Cleveland as follows:

Bessemer	$15 60 to 15 85
No. 1 Foundry	16 25 to 16 50
No. 2 Foundry	15 75 to 16 00
No. 3 Foundry	15 25 to 15 50
No. 2 Southern	15 85 to 16 00
Gray Forge	15 15 to 15 25
Gray Forge, Southern	14 25 to 14 50
Lake Superior charcoal	17 00 to 17 25

Finished Material.—Inquiries for a considerable tonnage of rails of standard size are pending, but no business has been closed this week. Manufacturers of steel bars say that they will not contract at less than 1.50c Pittsburg. While the demand for other products continues strong, the mills will roll crude steel with which to make those products and they do not anticipate that it will be necessary to make concessions to buyers of steel bars. The bar iron market shows signs of weakness, with prices ranging from 1.40c to 1.50c at the mill. Shafting is dull. Orders for boiler tubes are not numerous and independents are cutting prices. The demand for merchant pipe is also slack. There is little change in sheets. In spite of the limited demand for some lines of finished material, jobbers are doing a large business, and their stock of structural material is very much reduced.

Old Material.—Dealers in scrap are filling standing contracts, but at present prices are not actively seeking new business. The Baltimore & Ohio railroad came into the market and sold 14,000 tons of scrap during the week, but the 3,000 tons sold by the Norfolk & Western went into the Pittsburg and Cincinnati markets. We quote gross tons, Cleveland delivery, as follows:

Old iron rails	$18 50 to 19 50
Old steel rails (over 6 feet)	13 00 to 14 00
Old steel rails (under 6 feet)	13 00 to 14 00
Old car wheels	14 00 to 14 50
Steel boiler plate	9 50 to 10 50
Steel axles	15 50 to 16 50
Malleable iron (railroad)	13 00 to 14 00
Malleable iron (agricultural)	12 00 to 13 00
Heavy steel	13 00 to 14 00

We quote as follows, net tons:

No. 1 R. R. wrought	$13 00 to 14 00
No. 1 busheling	11 50 to 12 50
No. 1 machine cast	12 00 to 12 50
Iron axles	20 00 to 21 00
Axle turnings	10 00 to 11 00
Wrought turnings (free from cast)	8 50 to 9 50
Grate bars	8 00 to 9 00
Pipes and flues	9 50 to 10 50
Tank iron	8 50 to 9 50
Hoop and band iron	7 00 to 8 00
Sheet iron	6 00 to 7 00
Wrought drillings	8 50 to 9 50
Stove plate	8 50 to 9 00
Cast borings	6 00 to 7 00

PHILADELPHIA.

Dullness is Emphasized and Prices are Tending Downward.

June 20.

There is nothing of a decidedly encouraging nature to be said of the iron and steel trade. The coming of torrid weather, with its reminder that soon many of the mills will be closing for the regular summer lull, seems to have emphasized the dullness already prevailing, and with the deepening of the depression prices have softened. So far as pig iron is concerned, the market may be said to be deadlocked, so little buying is there. Buyers, noting the declining prices, are strengthened in their waiting attitude, while the producers, with their furnaces busy on old orders, refuse to make any large concessions for third and fourth quarter business, well knowing that before long the necessities of many consumers will drive them into the market. There is thus a basis of quiet strength for the trade and a hopeful feeling that when the process of readjustment now under way is completed there will be a lively market in the fall, with prices somewhat higher than at present.

Pig Iron.—So little new business has been placed during the past week that it is difficult to fix an exact range of prices. These are undoubtedly affected by the pressure of Southern irons upon the market. Makers of Standard Northern irons are not inclined to make any sweeping concessions to meet such competition, but rather than lose a good customer they will shade their prices from those noted last week. No. 1 furnace of the Warwick Iron & Steel Co., at Pottstown, has been blown out for repairs. The expectation that the tide would begin to turn about July 1 is now generally abandoned,

and producers are willing to push the date along several weeks. In prices foundry iron has shown the greatest weakness, due to sales here of Southern No. 2 X, dock delivery, as low as $15.50. The following figures may be quoted:

No. 1X Foundry	$17 25 to 17 50
No. 2X Foundry	16 50 to 17 00
No. 2 Plain	16 00 to 16 25
Standard Gray Forge	15 00 to 15 25
Ordinary Gray Forge	14 50 to 14 75
Basic	16 00 to 16 25
Low phosphorus	20 50 to 21 00

Finished Material.—The easing up in the demand for finished material is shown in a reduction of the premiums that have been asked for the past two months for anything like prompt delivery. This applies especially to the lighter lines and bar iron, for there seems to be no let-up in the demand for structural material, plates and the heavier lines. The schedule prices remain unchanged, as follows: Beams, channels and angles, according to specifications, 1.73½c to 1.85c; refined iron bars, 1.63½c to 1.80c; steel bars, 1.63½c to 1.70c; plates, 1.73½c to 1.80c.

Old Material.—In dullness the scrap market is a worthy rival to the pig iron, with the same tendency to lower prices. There are occasional inquiries, but with the prospective closing of many rolling mills for the summer months, as usual, the outlook for any immediate improvement cannot be called brilliant. Few sales are reported, to fix prices, but the following may be quoted as the local market:

Old steel rails	$14 75 to 15 50
No. 1 steel scrap	14 25 to 14 75
Old steel axles	19 00 to 20 00
Old iron axles	21 00 to 22 00
Old iron rails	17 50 to 18 50
Old car wheels	14 00 to 15 00
Choice scrap, R. R. No. 1 wrought	16 00 to 16 50
No. 1 yard scrap	15 00 to 15 50
Machinery scrap	14 50 to 15 00
Low phosphorus scrap	19 00 to 20 00
Wrought iron pipe	12 00 to 12 50
No. 1 forge fire scrap	12 50 to 13 00
No. 2 forge fire scrap, ordinary	10 00 to 11 00
Wrought turnings	10 50 to 11 00
Axle turnings, heavy	12 00 to 12 50
Cast borings	8 50 to 9 00
Stove plates	9 50 to 10 00

BIRMINGHAM.

Activity in Steel Making—Pig Iron Market is Weak.

June 20.

BIRMINGHAM, ALA., June 20.—There is little change in the pig iron market situation in the Southern territory. No. 2 foundry is usually quoted at $12 per ton, but sales have been made at $11.75. The production is fairly good. The Sloss-Sheffield Steel & Iron Co. will this week blow in their North Birmingham furnace, which was cooled down for repairs. The Sloss-Sheffield Co. has accumulated considerable iron. The furnaces in blast are still making a large quantity of iron. The Tennessee Coal, Iron & Railroad Co. No. 6 furnace at Ensley, the latest of its iron makers, broke the record again during the past week, manufacturing in twenty-four hours 403 tons of iron. This furnace was built for 300 to 350 tons of iron. The furnace has been under trial for the past few weeks. The first effort brought 360 tons. Then 380 tons was manufactured. The last effort brought out more than 400 tons of iron and the greater portion of it was good iron. Announcement is made that the new furnace of the Woodward Iron Co. is completed and ready for the torch. This furnace when in condition should make at least 350 tons of iron daily.

In the steel mart there is exceptional activity. The announcement is made officially that the Tennessee Coal, Iron & Railroad Co. is receiving orders for steel rail delivery next year at a lively rate and that already more than 50,000 tons of the product have been disposed of at prevailing quotations, delivery in 1906. President Bacon, of the Tennessee Co., is giving considerable attention to the steel production, improvements still being under way at the Ensley plant.

NEW YORK.

Little New Business—Inactivity Causes Some Sagging of Prices.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., June 20.

Pig Iron.—Consumers of foundry iron are still "playing a waiting game." Most melters are content to depend upon current deliveries on contract or are drawing upon future stocks apparently confident that inactivity will bring producers to a lower basis of prices. One or two inquiries have resulted in sales on the previous basis of prices, but they are of no great significance, and prices of Northern iron are nominally unchanged. Representatives of Southern furnaces are out for business on a basis of less than $12 Birmingham, but no sales at less than that figure can be traced to an authentic source. Inquiries are still plentiful, the International Steam Pump Co., among others, being in the market for 1,000 tons of special analysis iron for the plant at Harrison, N. J., 200 tons per week, beginning July 1. The same firm has placed orders for 100 tons of charcoal iron and 100 tons high phosphorus iron. A sale of 1,200 tons of Virginia iron to an Eastern manufacturing firm is reported. The strike among the New York and New Jersey foundrymen ordered last week has thus far inconvenienced no one seriously. The foundries are doing a satisfactory amount of business and producers are convinced that orders for more iron must be forthcoming before long.

Northern No. 1 Foundry	$16 50 to 17 25
No. 2 Foundry	15 75 to 16 75
No. 2 Plain	15 75 to 16 00
No. 1 Southern Foundry	16 25 to 16 50
No. 2 Foundry	15 75 to 16 00
No. 3 Foundry	15 25 to 15 75
No. 4 Foundry	15 00 to 15 25

Foundry pig iron warrants follow:

	Bid.	Asked.
June	15.00	15.50
July	15.00	15.50
October	15.00	15.50
February	15.10	15.50

Finished Iron and Steel.—Seasonable quiet marks business in all fabricated materials except structural steel, which enjoys undiminished activity. A moderate movement of rails continues and the producers of other forms have enough orders ahead to continue operations for many weeks, but interest centers about structural shapes. The American Bridge Co. has secured the contract for 24,000 tons of steel for the elevated works of The Philadelphia Rapid Transit system; also an order for 3,000 tons for the new Claflin building in this city. Several other large requirements are in sight, and smaller tonnages aggregating some 75,000 tons are to be placed in the near future. Among the latter is the material for the new Carnegie building, the home for the engineers' societies, which will require 2,500 tons. Business in bars and sheets is generally quiet with prospects for an excellent early fall trade. Plates are moving fairly on small orders. We quote New York prices at tide water: Angles, 3 to 6 in. x ¼ in. and heavier, 1.74½c; beams, 3 to 15 in., 1.74½c; channels, 3 to 15 in., 1.74½c; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.79½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.64½c; soft steel bars, 1.64½c to 1.67c; sheets in carload lots, New York, No. 28, black, 2.40c.

Old Materials.—The market continues quiet with prices weak and irregular. Sellers are showing a disposition to hold rather than consider the low prices offered, but consumers are able to secure what they need for immediate necessities at nearly their own figures. New business is extremely light, quotations approximately, f. o. b. New York, are as follows:

Old iron rails	$21 00 to 22 00
Old steel rails, long lengths	14 50 to 15 00
Old steel rails, short pieces	14 00 to 14 50
Relaying rails	20 00 to 21 00
Old car wheels	15 00 to 15 50
Old iron car axles	21 00 to 22 00
Old steel car axles	18 50 to 19 00
Heavy melting steel scrap	13 50 to 14 00
No. 1 railroad wrought scrap	16 00 to 16 50
Iron track scrap	13 50 to 14 00
Wrought pipe	11 00 to 12 00
Cast borings	8 00 to 8 50
Wrought turnings	12 25 to 12 75

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., June 20.

Pig Tin.—Although local trading has been light, the market remains firm. There was some speculative buying in London, but the effect upon prices here was not apparent. Today's closings are: Spot, 30⅜c to 30½c; June, 30¼c to 30½c; July, 30.20c to 30.40c; London, £138 17s 6d to £137 2s 6d. Arrivals 1,575 tons to date with 2,438 tons afloat.

Copper.—The domestic market has stiffened in sympathy with a feeling abroad due in part to the purchase of unusually large lots by London houses. Home melters seem to have covered their immediate requirements, but bought small supplementary tonnages. Today's closings follow: May, 15c; Lake and electrolytic, 15c; casting, 14¾c. London's closings today: Spot, and futures, £66 17s 6d. Exports for the month to date, 9,986 tons.

Lead.—There has been a moderate demand for all grades of pig lead, and prices were well maintained. The current consumptive demand is fair. Today's quotations: 4.50c to 4.60c. St. Louis, 4.44½c to 4.47½c; London, £13.

Spelter.—There has been very little trading during the past week and the market is barely steady. Today's closings: Spot, 5.35c; July and August, 5.25c to 5.35c; St. Louis, 5.07½c; London, £24.

Antimony.—The market is somewhat quiet but firm at the recently advanced prices. Today's prices are: 11c to 11½c for all brands.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, June 20.

The only change in metals this week is the rapid advance in the price of antimony. Stocks of this product are low and this fact becoming known created a sudden demand which was immediately reflected in prices. Spelter is weak and dealers are shading prices in the effort to stimulate demand. Other metals are without perceptible change. We quote as follows: Lake copper, 15c for carload lots, and 15¼c for less than carload lots. Casting copper, 14¾c for carload lots, and 15c for less than carload lots. Spelter, 5.25c for carload lots, and 5.50c for less than carload lots. Sheet zinc, 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig tin, 30c for carload lots, and 30½c for less than carload lots. Pig lead, 4.45c for 50-ton lots, 4.50c for carload lots, and 4.55c for less than carload lots. Antimony—Hallett's, 12c, and Cookson's, 13c.

Old metals are quiet in sympathy with the condition of scrap iron and steel. Our quotations, which follow, are merely nominal: Copper wire, 13c; heavy copper, 12c; light copper, 11c; red brass, 11c; red brass borings, 9c; yellow brass, 8c; yellow brass borings, 7c. Pipe lead, 4c. Tea lead, 3.60c. Zinc, 4.15c.

The directors of the Standard Screw Co., at a meeting at its Hartford, Conn., plant, declared a 3 percent dividend on common stock and a like amount on the preferred stock, payable July 1 to stockholders of record June 20. Solon C. Kelley, of New York, was elected a director.

RECEIVED FROM THE TRADE.

A catalogue of metal ceilings comes from the Berger Mfg. Co., of Canton, O., and with its wealth of illustrations suggests anew the possibilities of decorative sheet metal work. The examples of metal for architectural trimmings of various types are numerous and attractive.

Tobin bronze and its peculiarities are discussed in a pamphlet from the Ansonia Brass & Copper Co., of Ansonia, Conn., and New York, N. Y.

Circulars of blow pipes, soldering torches and coppers of ingenious construction are sent out by the Turner Brass Works, of Chicago. A neat monthly calendar suitable for the desk and with an effective arrangement for being kept prominently in sight is inclosed with the circulars.

The Newton Machine Tool Works, of Philadelphia, has a new catalogue, No. 41, dealing with rotary planing machines. These machines are made of one general design and in varying sizes, having cutter heads from 26 to 100 in. diameter over tools.

Northern crane catalogue No. 20 contains more than twice the number of pages of any previous catalogue of the Northern Engineering Works, of Detroit. An endeavor is made to show the wide range of the makers' designs though no extended description is attempted. Space has been given to as great a variety of designs as possible in order to exhibit the several types. A large line of electrical traveling cranes and electric hoists is shown as well as numerous designs of hand power traveling and jib cranes, pillar cranes, locomotive and power cranes, and overhead runways. The illustrations are especially informing.

The firm of Nichols, Dean & Gregg, of St. Paul, Minn., is fortunate in the legacy of a fifty-year record. The spread of time from 1855 to the present date has been summarized in a souvenir pamphlet and this is adorned with photographic reproductions of the several homes occupied by the firm in its business career. During this period changes have occurred and the personnel of the company from inception onward is here depicted. The company is now and has always been engaged in merchandizing heavy hardware; it has a mill for the manufacture of wagon hardware at St. Paul and has also a saw mill and factory in Arkansas.

A leather covered reference book contains general information and tables regarding the iron and steel sheet, tin and terne plate products of the American Sheet & Tin Plate Co. This is of vest pocket size, embodies some entertaining history, much specific data, and may be obtained from the headquarters of the company in the Frick building, Pittsburg.

Rear Admiral John D. Ford, U. S. N., is the author of a pamphlet dealing with the corrosion of boiler tubes. This publication contains an account of an investigation made at the instance of the Bureau of Steam Engineering of the U. S. Navy Department to ascertain the relative corrodibility of lap-welded Bessemer steel, lap-welded iron, seamless cold-drawn steel and seamless hot-drawn steel boiler tubes. The samples were obtained from the National Tube Co., which generously offered the use of its laboratory at McKeesport and bore the expense of installing the necessary apparatus, furnished the sample tubes, assisted in conducting the tests, and directed the photographer to make the photographs by which to ascertain the nature of the corrosion. The results have been detailed with illustrations in previous issues of *The Iron Trade Review*. The pamphlet now under consideration may be obtained gratis from F. N. Speller, of the National Tube Co., Pittsburg.

The Cincinnati Milling Machine Co., of Cincinnati, has brought out a new treatise on tool room grinding and grinding machines. This book contains considerable valuable information on the subject of cutter and tool grinding. Part 1 treats of the company's No. 1 universal cutter and tool grinder, a well-known machine. Part 2 is devoted to the No. 2 grinder, which

is a new tool and covers a field of its own. It is a complete universal grinder and has a range for cutter and tool grinding from the smallest cutters used in machine shops up to face mills 24 in. diameter, the same principle being employed in grinding all of them, and all handled with the same degree of accuracy and convenience. The numerous illustrations show exactly how to handle the work, and the descriptions in connection with them give useful data on cutter grinding, no matter what machine is used. The book is sent free of charge to those interested in this subject.

The latest bulletin, No. E-101, from the Chandler & Taylor Co., of Indianapolis, illustrates a line of enclosed self-oiling engines. These are claimed to be the first to be manufactured in accordance with the recommendations of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. These engines are of a type peculiarly well adapted for direct connected service.

A supplement to catalogue A of the Manville Bros. Co., of Waterbury, Conn., presents the dimensions of two new automatic wire and metal forming machines. These are Nos. 34 and 40 and are adapted to handle soft steel wire up to .250 in. and .312 in. respectively. The supplement also illustrates the "Yankee" bench press which is described in a special circular.

The Marine Iron Works, of Chicago, has a supplement to the No. 16 catalogue. This contains a few of the various sizes and types of marine engines and boilers lately built by the firm.

A booklet, entitled "The Applications of Nickel Steel," has a list of the purposes to which nickel steels have been successfully applied in the United States, France, Germany and England. It is essentially a copy of the index to information gathered by the International Nickel Co., of New York, for the benefit of those interested either in the manufacture or the industrial applications of this class of material.

The Crocker-Wheeler Co., of Ampere, N. J., has a pamphlet of electric fans as employed for ventilating purposes, steam heating systems, etc. The publication is designated as Bulletin 54.

Some new tools for machinists are excellently illustrated in a pamphlet from the Brown & Sharpe Mfg. Co., of Providence, R. I. The tools include caliper sets in cases of six, suitable for the tool room requirements of any machine shop or manufactory, improved steel beam trammels, universal dividers, scribers, knife edge straight edges, etc.

The federal court has granted permission to the receiver of the Diamond State Steel Co., of Delaware, to sell personal property of the concern, some of which is pledged to Pennsylvania concerns. It is believed that the plant of the company will be run after the sale is made.

C. & A. Patts & Co., Indianapolis, Ind., have let all contracts for rebuilding their foundry and replacing the machinery. The new structure is of steel and brick and as near fireproof as it is possible to make it.

The Garry Iron & Steel Co., Cleveland, is doing an exceptionally good business in charcoal iron roofing, conductor pipe, tin plate and a general line of iron and steel roofing sundries. The structural part of the plant, which had been abandoned, has been leased to other parties.

S. V. Huber & Co., consulting engineers, Pittsburg, have been retained as consulting engineers for the construction of the plate mill to be erected by the Youngstown Sheet & Tube Co., Youngstown. This firm does all the engineering work in the erection of the company's present plant.

Explorations are to be resumed at the Anderson property on the Vermillion range near Ely. The names of the parties who will do the work have not been divulged. The Anderson mine was worked during the early nineties and a shaft had been sunk to a depth of over 200 feet with encouraging results. The slump in iron which came in 1893 put a stop to further work and the entire machinery and equipments were disposed of. At that time those interested were Col. Gridley, Jas. T. Hale and C. P. Maginnis, of Duluth, and several in Ely. Captain Jas. Bale was then in charge of the work.

Republic Iron & Steel Co.

Concerning the many rumors in circulation about changes in the Republic Iron & Steel Co. which have been published, all that can be stated with certainty as to its accuracy is that the offices of the accounting and operating departments will be moved to Youngstown. The executive and sales offices will be retained in Chicago. What will be done at the meeting of directors in October no one can predict.

The Brown Specialty-Machinery Co., Chicago, announces it has closed arrangements with the Thomas W. Pangborn Co., 42 Dey street, New York, whereby the latter concern will have the exclusive sale of the former company's "hammer" core machines and equipment for the New England states, New York and New Jersey.

Henry Russel, chief counsel of the Michigan Central Railroad, has announced that the building of the Michigan Central's double tunnel under the Detroit river, at Detroit, will necessitate the construction of a new foundry plant of a large capacity to take care of the work and supply material for the tunnel.

At the Grant mine of the Jones & Laughlin Co. at Buhl, Mesaba, there is being installed one of the most extensive improvements for stripping and mining ore which has been placed in operation at any of the mines of the Lake Superior country. The new machinery, which is expected to accomplish much in the way of an innovation in mining, will probably be in operation by from the first to the middle of September and possibly even before that time.

The Buffalo & Susquehanna Iron Co., owning the lease of the Susquehanna mine at Hibbing, is now engaged in drilling the ore body to learn accurately the full extent of the deposit. It has been measured up to about 12,000,000 some time ago and it is supposed to be considerably larger, and in order to ascertain the best method of development the company will learn the whole deposit. It may be stripped, although that ore body is covered by a thicker stripping than any that has yet been stripped.

John T. Quinn, of Ishpeming, has been appointed county mine inspector for Marquette county, Mich., over two other candidates. Mr. Quinn has been employed at the Lake Angeline mine, Ishpeming.

The Battery Self-Threading Sewing Machine Co. has been incorporated with $120,000 capital stock. The incorporators are: S. B. Battery, Alfred Muller and W. Hampton de Fontaine. The company is to deal in patents, trade marks, copyrights, concessions and options for the sale of such property. The registered office is East Orange, N. J.

The Charles A. Thomson Co., New York, has been incorporated with $25,000 capital stock. The directors are: C. A. Thompson, James Shaw, Brooklyn, and Rudolph Miehling, New York. The company will deal in electrical machinery.

The Sterling Blower & Pipe Mfg. Co., Hartford, Conn., has filed articles of incorporation showing an authorized capital stock of $150,000. The concern succeeds a co-partnership which had been doing business for several years under a similar name.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE PENTON PUBLISHING CO.

CLEVELAND, OHIO.

CHICAGO - - - - 1164 Monadnock Block.
PITTSBURG - - - - - 521 Park Building.
NEW YORK - - - - - - 150 Nassau St.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.
European Agents, The International News Co., Breams Buildings, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

JUNE 22, 1905

AMALGAMATED ASSOCIATION WAGE SETTLEMENTS.

Negotiations between the Amalgamated Association of Iron, Steel and Tin Workers and the manufacturers are conducted on quite a different basis from that which prevailed a few years ago. It has come to be recognized that these adjustments are purely a business matter, and conditions have more force than precedents in controlling the proceedings. The prompt agreement on the iron wage scale a fortnight ago was a pleasing relief from the long drawn out uncertainty of last year. This year a four days' conference reached an agreement which carried with it an advance, trifling, perhaps, but still an advance. Last year the first conference was held June 7, while after more than three months of uncertainty, an adjustment was reached by conciliation, on September 11, the adjustment carrying a considerable reduction.

In the handling of the sheet and tin plate scales the same businesslike methods are being followed, while precedents are being disregarded. It has heretofore been the custom for the scale conference to be held with the leading interest in the line represented, the independents afterwards signing the scale as thus agreed upon, or signing the scale provisional upon their receiving whatever terms should be reached in conference. This year, however, for reasons which may perhaps be surmised, the leading interest has not shown any interest in arranging for a conference on the sheet and tin plate scales. The independents, feeling that this delay in getting started upon scale deliberations might inure to their disadvantage, called a meeting last week and it was promptly arranged with the Amalgamated Association that a conference should be held this week.

It is quite significant of the present flexibility of scale negotiations, not simply that the independents should have a conference at all, but that they should hold their conference before the leading interest holds any.

As to the merits of the issues on which the manufacturers and workmen join in the sheet and tin plate scales there can be much more said on the part of the manufacturers than on the part of the men. This is but natural, since no demands have been formulated on the part of the manufacturers, while the men have put out demands for advances of 18 percent on the tonnage sheet scale, and 22 percent on the tin plate scale. The position of the manufacturers, therefore, is simply that of combatting the demanded advance. The men, on the other hand, have had no opportunity of showing the disposition they probably have, of being willing to recede from their position, while they cannot attack the manufacturers' position, since it has not been defined.

The contention that there should be an advance in sheet and tin plate wages because there was an advance in the iron scale is not well founded when it is considered that the advance in the iron scale was confined to the operations of making the crude material, being only slight in those departments, while the finishing scale was not advanced at all. The sheet and tin plate scales cover what are strictly finishing operations. Further, there is the important difference that there is a greater proportion of non-union mills in the sheet and tin plate branches than in iron working. The proportion of non-unionism in sheets and tin plates was fully brought out in summaries printed in these columns a fortnight ago. The weakest point in the Amalgamated Association's position in the trade is that only 29 percent of the leading interest's sheet capacity is on a union basis. It would be really absurd to allow a settlement of the sheet scale with the leading interest to control the independents, when they have a proportion of 62 percent union, and a total number of union mills about double that of the leading interest. It is obviously right that the independents should have a conference.

SUPPLEMENTING CONNELSVILLE COKE SUPPLIES.

A mild sensation was caused five years ago when C. M. Schwab, president of the newly formed United States Steel Corporation, testified before the Industrial Commission at Washington: "If the consumption of steel increases in the future as it has in the past I believe the Connellsville coal will be exhausted in 30 years." Coupled with his opinion that the Connellsville coal is particularly valuable, standing preëminent among all the coals of the country for iron making coke, it certainly appeared unfortunate if the steel industry were in danger of being suddenly checked in less than a third of a century by the exhaustion of the ideal fuel for iron making.

Developments in the succeeding five years have

been in two directions. Granting that the total amount of coal in the Connellsville region was as stated, the rate of exhaustion has become more rapid, while other fuels have come more to the front, and on the whole the prospects have become more favorable.

In the spring of 1901 there were about 21,500 ovens in the old Connellsville region. Now there are 30,000. Of the increase of 8,500 ovens, almost four-fifths has come through the exploitation of the Lower Connellsville or Klondike region. This is substantially an addition, as that coke is not greatly inferior to the old line Connellsville, and as the latter becomes worked out, higher sulphur coal is being encountered, so that the difference is being steadily minimized.

Our production of pig iron in 1901 was 15,878,354 gross tons, which broke previous records by over 2,000,000 tons. What our production is now is a problem, since we recently reached a rate of approximately 24,000,000 tons, but are now falling much below that rate. Still, it has been shown that we can, so far as coke is concerned, sustain a rate more than one-half greater than that in 1901. Despite the large increase in Connellsville capacity owing to the development of the Klondike region, the greatest increase in coke production has come from outside districts. Thus the report on West Virginia coke production presented in these columns a week ago shows that the coke production of that state increased from 1,932,912 tons in 1901 to 2,276,451 tons in 1904, thus more than doubling in three years, while production lately has of course greatly exceeded the average rate for 1904. In other districts also there have been increases.

While it is recognized that for blast furnaces having the greatest output per stack the Connellsville fuel is the ideal one, good outputs are being made on other grades of coke. Thus, the Alabama coke, while it has not been held to permit of very high outputs, does very well in its way, particularly considering that the ores which it must melt are much poorer than the Lake Superior ores, with which Connellsville coke is usually associated. The latest furnace completed in Alabama has already made 366 tons in one day, understood to be a record for any furnace in that state, and it did this on an ore mixture, largely self-fluxing, containing only 32 percent of iron.

Bi-product coke is coming into increased favor, and good results have been obtained in both furnace and cupola work. Dunbar furnace, for instance, has operated exclusively on bi-product coke, with outputs exceeding that for which the furnace was built. The recent American Foundrymen's Association convention in New York brought out a paper on melting ratios with bi-product coke, dealing with results in practical experience, which results show up quite favorably.

Altogether, it is evident that the American iron industry will not be seriously checked by the exhaustion of the old line Connellsville coking coal deposits. Developments elsewhere are coming so rapidly that the event, so much feared at one time, may pass purely as an incident.

ACTIVITY IN IRON MILLS.

The weekly reports to the *Amalgamated Journal* of iron mill operations last week show an unusual degree of activity. It happens that this journal's reports last week were unusually full. As they are made directly by the men who are working in the mills, they represent faithfully the actual conditions. A summary of all the reports relating to the operation of puddling, scrapping, busheling, swarth, board and other furnaces and knobbling fires shows that there were reported a total of 428 furnaces in operation and 92 idle. This is an excellent record, since from the nature of the operations there is always more or less idleness even when orders are plentiful.

It has been a common saying in the iron and steel trade in the past few months that the iron branch of the industry was not getting its share of the general prosperity, that the activity was much greater at steel mills than at iron mills. Certainly the above record does not, on its face, bear out this opinion of the situation. The prompt settlement of the iron wage scale for the year beginning July 1 next, was doubtless an outcome of the activity which is thus shown.

The heavy production of iron products, including iron bars, iron skelp, etc., at the present time is no doubt due in large measure to the heavy decline in scrap in all markets. During the winter and early spring scrap prices were very high and even at the higher prices which iron products commanded over steel the profits were not large. Consumption was interfered with. Now the trade has resumed a more normal position. Scrap prices are moderate, and prices of iron products are more comparable to those obtained for cognate products made of steel.

MR. SWANK'S ANNUAL REPORT.

The Annual Statistical Report of the American Iron and Steel Association for 1904, which has just been issued, is a monumental tribute to the industry and accuracy of General Manager Swank and his assistants. A few of the tables from the Statistical Abstract are given elsewhere in this issue and the general summary was published last week. The statistics given in the Report and Abstract relate to every branch of the iron trade and go back as far as such statistics are available. Never before has such a valuable compilation been made.

In his introductory chapter, Mr. Swank says:

Our last annual report gave in sufficient detail the leading facts bearing on the reaction in general business conditions in this country which began in the first half of 1903 and continued until August and September of 1904, when unmistakable signs of the end of the reaction were visible on every hand. In October business confidence was entirely re-established. Before the close of this month railroad and industrial stocks

had greatly advanced in price and the manufacturing industries of the country were again as active as if nothing had happened to interrupt their prosperity. The railroads were busy moving the good crops of the year and the products of our mines, forests and manufacturing establishments. The favorable condition of business continued all through the winter, notwithstanding its exceptional severity, and has been continued without abatement through the spring months of the present year. In April railroad and other stocks reached still higher figures than during the preceding fall and winter. Prices of farm products have continued in the main to be satisfactory to the farmers. This review closes with April.

The improvement in general trade conditions noted above has particularly affected the iron trade, so much so that for several months the demand for iron and steel products in this country has never been equaled. It has taxed and is still taxing our manufacturing plants to their utmost available capacity. This extraordinary activity is probably of more general application to all branches of the iron trade than any similar demand in other years. Certainly our manufacturers of pig iron, steel rails, structural steel, plates and sheets, cars and locomotives (including railroad shops), and general machinery and foundry products were never more actively employed than they are today. The whole country urgently wants iron and steel for a thousand uses. Our export trade in some iron and steel branches is also contributing to the general activity. But the greatest demand for iron and steel comes from the railroads. The fact is now generally recognized that our railroad managers have not kept abreast of the country's marvelous industrial development in the last few years. More tracks, more cars, and more locomotives have been needed than had been built, and also more bridges and better terminal facilities. Some of these managers awakened to the necessity of meeting these deficiencies before the general revival of prosperous conditions last year, but others did not awaken to the needs of their roads until the present year, and it is to the suddenness of this awakening that we owe much of the existing unprecedented demand for iron and steel.

The decline in the production of iron and steel which began in the second half of 1903 was not generally arrested in the first half of 1904 and was particularly noticeable in June and July, but it was entirely checked in August and September. The production during the year was less in many lines than in 1903, the increased activity in the last few months of the year falling very far short of equaling the losses in production during the remainder of the year. The production in all lines in 1905 promises to be much the largest in our history.

Naturally and properly prices of iron and steel have advanced since the improvement in demand began in August and September of last year, but this advance has wisely been kept within reasonable bounds. Steel rails have not been advanced at all. Such advances as have taken place have been justified in large part by advances in the prices of raw materials. Prices in 1904 were at their lowest ebb in the third quarter; some prices were the lowest that had been reached since the reaction in 1903 began. The average monthly price of Bessemer pig iron at Pittsburg fell in September, 1904, to $12.69 per ton, from which there was a gradual advance to an average of $16.72 in December and January. At the end of April the price was $16.35.

The workingmen employed at our iron and steel works and in auxiliary mining operations and at coke works have shared in the general revival of prosperity. They have had steady employment and their wages have been increased from ten to twenty percent.

It is gratifying to be able to present the foregoing favorable report of the complete restoration of prosperous business conditions in 1904, following the great shrinkage in the stock market in 1903 and the accompanying interruption to industrial activity. The outlook for a continuance of the present favorable business situation is very hopeful. There is absolutely no cloud visible upon the industrial and financial horizon, unless it is to be seen in the threatened revision of the Dingley tariff, to which much of the country's present prosperity is undoubtedly due, but this cloud can be easily dissipated during the present summer, and it ought to be. As a rule our senators and representatives in congress represent states and industrial communities whose prosperity would be more or less seriously affected by a revival of tariff agitation, and they will certainly listen to appeals from employers of labor and workingmen to let well enough alone. We hope that these appeals will be made. We have yet to hear of one American industry that has been injured by the Dingley tariff; all have been materially helped by it.

One of the most hopeful signs of the future is to be found in the liquidation during the last two years of large blocks of indigestible securities which precipitated the depression of 1903—the so-called rich men's panic. Inflated stock values will be with us again, of course; they can not be prevented; but the wild speculation in stocks without any value whatever which prevailed for several years after the beginning of the boom of 1899 is practically at an end. As we close this general review at the end of April the stock market is in a healthy condition, most stocks being quoted at conservative figures.

The Stewart Iron Co.'s blast furnace, Sharon, Pa., has closed down for repairs. The stack will be relined.

The Marietta and Newcomerstown, O., sheet mills of the United Sheet & Tin Plate Co., of Columbus, will be opened some time in July. These mills have been idle for more than a year, but with a reorganization of the company it has been decided to gradually resume operations at all the plants.

The Cast Steel Co., of Allegheny, Pa., was incorporated at Dover, Del., this week with a capitalization of $300,000. The incorporators are: Lyman S. Ailes, of Allegheny, and Ira C. Ewing and Homer W. Case, of Pittsburg. Nothing has yet been given out as to the plans of the new concern.

The W. DeWees Wood plant of the American Sheet & Tin Plate Co., McKeesport, Pa., was closed this week for repairs.

Blast Furnace No. 6 at the Ensley, Ala., plant of the Tennessee Coal, Iron & Railroad Co., is breaking all records for Southern iron production. On June 6 this furnace broke all previous records by producing 355 tons. On June 7, 364 tons were produced, June 8, 372 tons, June 9, 384 tons, and June 15, 403 tons. With the low grade ores used this output is equal to almost any of the big records made in the North as none of the ores in use at this stack run over 40 percent.

The new blast furnace at the Wheeling Steel & Iron Co., Martins Ferry, O., has been completed, and will be blown in as soon as a stock of ore is secured.

The Humbert tin plate plant of the American Sheet & Tin Plate Co., Connellsville, Pa., has been shut down. The plant contains six mills.

Judge Bradford, Wilmington, Del., has denied the application of counsel for the petitioners to amend the petitions in bankruptcy against the Diamond State Steel Co., and granted the application of counsel for the company to dismiss the petitions because they were insufficient in their allegations of bankruptcy.

The New York Air Brake Co., at its annual meeting at Jersey City, re-elected the old board of directors, but the vacancies caused by the death of Daniel Magone and H. A. Rogers were not filled.

CIVIL ENGINEERS

In Session in Cleveland—Points of Interest are Visited.

The 37th annual convention of the American Society of Civil Engineers convened at the Hollenden hotel, Cleveland, Tuesday morning with an attendance of nearly 600 members, and in the absence of Mayor Tom L. Johnson, were welcomed to the city by Dr. Cooley, of the Board of Public Service, who extended to them the keys of the city and expressed his appreciation of the presence of such a large number of distinguished engineers. He spoke of the greater opportunities and possibilities to mankind in general, opened up by the work of the engineers and the wider range constantly sought by them in all matters of construction and the advanced sciences. C. C. Schneider, president of the society, responded, thanking Dr. Cooley for his warm welcome and said the engineers were glad to accept the hospitalities of the city presided over by a man who had done so much for engineering as Mayor Johnson. President Schneider's address, delivered Tuesday evening, was upon "The Evolution of the Practice of American Bridge Building." He traced bridge construction from the early Roman structures of gigantic proportions by men who had no theoretical knowledge, down to the present day where the modern engineer has not only practical and theoretical knowledge to assist in his work, but also mechanical appliances and modern tools which were not known to the ancients.

The Wednesday morning session was devoted to descriptive talks on points of interest and typical industries of Cleveland, among the speakers being Major Dan C. Kingman, United States Engineer; W. J. Carter, City Engineer; Alex A. Brown, of the Brown Hoisting Machinery Co.; Harry Fuller, of the King Bridge Co., and Prof. Howe, president of Case School of Applied Science. During the afternoon the visiting engineers visited the plants of the Brown Hoisting Machinery Co., King Bridge Co., The Wellman-Seaver-Morgan Co., Case School of Applied Science, and the Cedar avenue power house of the Cleveland Electric Railway Co.

The executive committee of Cleveland members of the society were August Mordecai, chairman; F. C. Osborn, secretary; W. J. Carter, Harry Fuller, E. A. Handy, S. T. Wellman, A. W. Johnston, M. W. Kingsley, J. F LeBaron, Walter P. Rice, James Ritchie, W. H. Searles and C. H. Wright. Elaborate plans for the entertainment of the engineers and ladies were made, conveyances taking them through the parks to Garfield's monument and the Country club Tuesday afternoon Wednesday evening an entertainment and informal dance was given at the Hollenden hotel and on Thursday evening a reception was given at Chamber of Commerce hall.

The proposition of establishing local chapters of the society was discussed Monday morning, but was put over until Thursday for final decision.

The Case School of Applied Science, Cleveland, has installed a new transverse beam testing machine built by Riehlé Bros. Testing Machine Co., of Philadelphia. At the invitation of President Chas. S. Howe a number of engineers and others interested in testing materials visited the mechanical laboratory of the school and witnessed an exhibition of the machine on June 14. The machine has a capacity up to 100,000 lb. and will test beams up to 20 ft. span and 18 in. in height. A sample I beam, 31½ lb. to the ft., 15 ft. x 12 in. from one of the new buildings was put into the machine an dthe pressure and deflection recorded by increments. Then a beam of Georgia pine about 15 ft. long and 6 x 10 in. at cross section was tested to fracture. The machine worked admirably and will be a valuable acquisition to the laboratory equipment.

CHAMBERLAINISM AND AMERICAN MACHINERY

An American manufacturer of typewriters who recently returned from England sees grave danger to the export machinery trade of this country in the movement among British politicians for a tariff on manufactured products. He finds that sentiment against imported goods is growing and that producers are doing their best to create a feeling against foreign manufactured products. The war cry, "Give us a square deal," is likely to be heard rather frequently, for business has been exceedingly slack among manufacturers over there. The reason for the gentleman's trip across the Atlantic is significant. He went to arrange the sale of his patent rights for British territory because the firm with which he had had large dealings in the past refused to receive more of his typewriters. Somewhat to his surprise, he learned of organized search for articles which could be manufactured and placed upon the market to shut out foreign products. He feels that in view of the fact that English shops are filled with American machinery the importance of the movement is apparent. The lesson of the situation to this manufacturer is right here. To be sure, it is only the high-class machinery produced in this country that is in demand abroad, and that demand depends upon the superior quality and efficiency, but supremacy of that kind is not maintained without effort. High pressure toward meritorious design combined with reasonable prices is the only resource for the future—just as intensified manufacturing has led to the greatest industrial progress hitherto. The remedy is old but sufficient when the treatment is continuous.

New Light Rail Mill.

The new light rail mill which the Carnegie Steel Co., Pittsburg, is erecting at its Edgar Thomson plant will be completed early in October. This new mill will roll light sections from 8 to 30 lb. When this mill is completed there will be three rail mills at this plant, No. 1 rolling from 60 to 100-lb. sections, No. 2 rolling from 25 to 70-lb. sections and the new mill, which will be known as No. 3. This mill will roll the lighter sections from both billets and rail seconds. It will consist of four stands of rolls, the first stand where the rolling passes will be made being three-high, while the other three stands will be two-high. There will be three roughing passes, two passes through the next two stands and one through the last stand, making eight in all. The steel building that will contain the mill will be 80 x 300 ft., and the monthly output will be from 10,000 to 12,000 tons.

SLOSS-SHEFFIELD REPORT.

The Sloss-Sheffield Steel & Iron Co. reports for the quarter ended May 31, net profits of $428,484, an increase over the same quarter of 1904 of $149,999. The interest, taxes and preferred dividends remaining the same, the surplus earnings of $254,484 represent an increase of the same amount. The total surplus at the beginning of the quarter was $2,475,245 and at the close $2,729,729. The directors of the company have declared the regular quarterly dividend of 1¾ percent on the preferred stock, payable July 1. J. N. Wallace, president of the Central Trust Co., was elected a director, succeeding W. E. Strong, deceased.

The stockholders of the International Steam Pump Co., at their annual meeting in Jersey City, re-elected all but one of the old board of directors, the exception being H. B. Hollins, who is succeeded by J. B. Haggin. The stockholders of the Blake-Knowles Steam Pump Co., a subsidiary corporation, elected as directors Charles L. Broadbent, Max Nathan, Alfred Nathan, John W. Dunn, Isaac Untermeyer, Marcus Stine and Theodore L. Herrmann.

SHEET AND TIN PLATE SCALES

Being Considered by Amalgamated and Independents.

A conference between the independent sheet and tin plate manufacturers and the sheet and tin plate wage scale committees of the Amalgamated Association opened at Pittsburg at the Hotel Lincoln on Wednesday. A meeting of the independent manufacturers was held at Pittsburg on Wednesday, June 14, and it was decided to ask for a conference with the association. It is doubtful whether an agreement will be reached, as the independents are anxious to learn what steps will be taken by the American Sheet & Tin Plate Co. with reference to a settlement of the wage scale. There is no truth in the reports that the scale will be signed as reported from the convention, believing that the American Sheet & Tin Plate Co. will close its mills on July 1. The leading interest could well afford to close its union sheet mills during the summer months as it would mean only 29 percent of its capacity, but in the tin plate trade 70 percent of its mills are union. The shutting down of these mills temporarily, considering the present condition of the tin plate trade, would incur no hardship.

OLD CONTRACTS RENEWED.

(Special Telegram.)

BIRMINGHAM, ALA., June 20.—The old contract was renewed with the United Mine Workers' of America, Alabama District No. 20, by the Commercial Coal Operators and the Alabama Consolidated Coal & Iron Co., effective July 1. Col. Bush, president of the Alabama Consolidated, complimented the miners in the convention for their businesslike methods and good officials. The strike at furnace company mines is still on.

TIRED OF THE LONG STRIKE.

A mass meeting of the striking puddlers of the Carnegie Steel Co. plants, Youngstown, O., was held on Sunday, June 18, and it was decided to send a committee to Pittsburg to confer with the officials of the Amalgamated Association with reference to returning to work at the Youngstown mills on a non-union basis. If no agreement can be reached with the Amalgamated officials that will prove satisfactory to the puddlers it is probable that the men will return to work in a body and break away from the association entirely.

LABOR NOTES.

The eighth annual convention of the United Mine Workers of American District No. 20, was in session at Birmingham, Ala., last week. The convention was called for the purpose of agreeing on a working scale for the year beginning July 1.

The patternmakers at the plant of the Malleable Iron Co., Columbus, O., went on strike June 9, demanding an increase of 2½ cents per hour, for which the members have been standing out for some time. President James Wilson, of the National League, announces the Case Mfg. Co., the Kinnear Mfg. Co., W. Brantner and the New American Elevator Co. signed a contract and the men in these shops are working at the increased scale.

Most of the former employes of the Youngstown, O., plants of the Carnegie Steel Co., Pittsburg, have already returned to work. About a year ago a strike was declared on at all of the mills of the old American Steel Hoop Co. branch owing to the refusal of the company to sign the scale as presented. As the strike has been hopelessly lost the former employes are breaking away from the association and are endeavoring to secure their former positions.

The plant of the Corry Radiator Co., Corry, Pa., has been purchased by the United States Radiator Co.

PERSONAL.

Joshua Peters, general manager of the Record Foundry & Machine Co., Moncton, N. B., has recently returned from a trip to the Pacific Coast, where he established new agencies for his company.

Jas Hall, foreman of the molding department of the Mississippi Valley Stove Works, of Fulton, Ill., has resigned his position to accept a similar position at the Riverside Stove Works, of Rock Island, Ill.

Chas. R. Darrow has resigned his position as president and general manager of the Mahoning Foundry & Machine Co., of Youngstown, O. He expects to take an extended rest before engaging in active work again.

R. C. Campbell, at the annual meeting of the stockholders of the Illinois Steel Co., was elected a director to fill the place made vacant by the resignation of C. H. McCulloch. The place of second vice president, made vacant by the retirement of Mr. McCulloch, was not filled.

George Hayden and Theodore Riefsnyder have purchased one-third interest in the Pratt Machine Works, Carrollton, O., and the new concern will be known as the Carrollton Mfg. Co.

President Don H. Bacon, of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has created the office of general manager of mines and quarries belonging to the company, and Edward Ball has been appointed to the position. He will attend to some duties that have heretofore devolved upon the president.

R. A. McKinney, of Pittsburg, representing the American Sheet & Tin Plate Co., has been elected a director of the Standard Lead & Zinc Smelting Co.

Chas. A. G. Winther, for many years general superintendent of the Chapman Valve Mfg. Co., of Indian Orchard, Mass., has accepted a similar position with the Roe Stephens Mfg. Co., of Detroit, Mich.

Charles R. Darrow has resigned as president and general manager of the Mahoning Foundry & Machine Co., Youngstown. He is still a stockholder and a director of the company. F. G. Evans is in temporary charge of the company's affairs.

Frank Baackes, vice president of the Republic Iron & Steel Co., has returned from his trip to Europe.

A. L. Humphrey, western manager of the Westinghouse Air Brake Co., at Chicago, has been appointed general manager of that company, with headquarters at Pittsburg, to succeed E. M. Kerr, who has been made vice president of the Westinghouse Electric Co. Mr. Humphrey, until two years ago, when he went with the Westinghouse Co., was superintendent of motive power of the Chicago & Alton Railroad.

Ralph Crawl, master mechanic of the Bessemer plant of the Republic Iron & Steel Co., Youngstown, O., on July 1 will also assume the duties of master mechanic of the company's Brown-Bonnell plant. Erskine Maiden and John Morgan have been appointed first and second assistants respectively. William Carroll, who has held the position of master mechanic of the Brown-Bonnell plant, retires on July 1.

The H. W. Caldwell & Son Co., of Chicago, has installed a Niles Tool Works Co.'s boring and turning tool with a capacity for sheaves, pulleys, etc., up to 20 ft. diameter by 96 in. face. In addition to the ordinary functions of such a tool, this mill is fitted with a grooving attachment for machining the faces of sheaves or drums spirally, for winding hoisting ropes, etc. Some idea of the size of the tool may be given by stating that its weight is 160,000 lb.

The business of the Taunton Locomotive Mfg. Co., Taunton, Mass., is to be liquidated and the company, it is understood, will sell its entire property. Treasurer William R. Billings and William C. Davenport, both of Taunton, have been appointed to act for the board.

DRAINAGE OF THE INTERBOROUGH SUBWAY UNDER THE HARLEM RIVER.

One of the most important engineering problems encountered in the building of the New York Rapid Transit Subway was the construction of the two tunnels under the Harlem river. These tubes, through which the Subway trains are to run regularly from the Lenox Avenue Subway to the Bronx Subway, were constructed on a novel method built of concrete above the ground and then sunk to the bottom of the river. These twin tubes are 641 ft. in length and are 16 ft. in diameter, the top of the tunnel being 20 ft. below low water mark. Before the tubes were put in place, the engineering department of the subway contractors devised a system for the drainage of the water percolating through the walls of the tubes, also the sudden inrush of water in the event of the breaking of a water main. The drainage and pumping system adopted, and the precautions taken to meet the possible conditions, are here described.

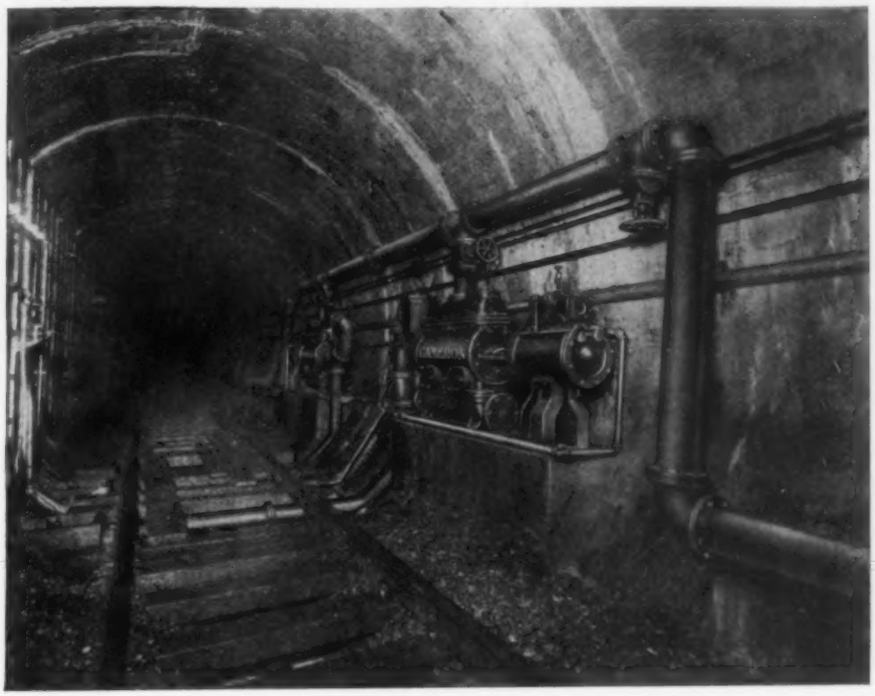

FIG. 1—TWO OF THE DRAINAGE PUMPS IN THE SUBWAY.

The pumps are in position in both of the tubes at the junction of the Subway and mouth of the tunnel at Harlem river. Special pumps were adopted for this service, designed and built by A. S. Cameron Steam Pump Works, of New York. Figs. 1 and 2 show the inside construction of the tunnel with pumps in position. In the first of these two views a portion of the end of the concrete archway is shown, and it is at this point where the two tubes are joined, and the double tracks continue in the tunnel.

Fig. 1 shows two of the pumps in position on concrete foundations, with the arrangement of piping and connection. Four of these pumps were installed, being of the size 12 x 12 x 18-in., and are of the simplex single cylinder pattern. The motive power for these pumps is compressed air. Each of these pumps have their separate air lines to the compressor plant, which is over three-quarters of a mile away above ground. The pumps are controlled automatically by separate floats located in the tunnel. The automatic float for one of the pumps is shown in the illustration along the wall on the left hand side. The other pump, in the distance, has its automatic float nearer the floor and attached to the pump. An air reservoir 16 in. in diameter by 36 in. long is in the air pipe line at the throttle of each pump. The suction piping is also shown extending into the pump, the top of which is protected by iron gratings. Fig. 2 defines more clearly the outside construction of the pumps, the distinctive feature of which is the construction of the water cylinders which necessarily are very compact, owing to the limited space allotted to them, the extreme width being only 19 in.; nevertheless they have ample water valve area. The water valves are set in removable valve decks, allowing them to be easily removed at minimum time cost. The suction valves are placed under the water cylinder, and the discharge valves are shown above the water cylinder.

The pumps are separately and independently connected and are also designed with the suction and delivery flanges looking fore and aft, permitting the arrangement of the suction pipes as shown, with the pipes running under the "air end," and the foot under the air end made in two parts, straddling the 6-in. suction pipe, permitting the piping to be readily removed. Each of these pumps is capable of delivering 600 gallons of water per minute while running at a normal speed, with an air pressure at the throttle of about 70 lb. per sq. in., and a total lift of 70 ft.. The capacity can be increased to 1,000 gallons per minute in case of emergency.

The valve chambers permit of easy access for inspection and necessary repairs. The water piston and rods are of composition metal and owing to liability of water being dirty and very gritty, the water cylinders are constructed with removable composition metal bushings. The suction pipes of the pumps have strainers of the gooseneck pattern to keep out dirt and rubbish, and to insure the priming of the pumps by keeping the suction chambers filled with water; thus the cylinders will be flooded with water at all times and the pumps may be started up at any time by the automatic floats. In the event of the water rising, each of the pumps would immediately start pumping as soon as the water would reach the float level.

These pumps were severly tested owing to water in the tunnel some time ago. Temporary piping and connections were hurriedly made and the pumps were pressed into use at short notice, being in operation day and night, and performing good service; the inflow of water being entirely taken care of, and causing but a slight interruption in the completion of the work. Floating timbers and debris, which are oftentimes the cause of damage to submerged pumps, can do no harm to Cameron pumps, as the working parts are not exposed. A Cameron pump has been submerged under water for weeks and has kept right on pumping to the limit of its capacity until it has cleared the shaft or mine.

The Cleveland Twist Drill Co. reports business in machine tool trade prosperous in the Central West and West, but reports from the Eastern States are less favorable. The company has orders booked for several months ahead.

On a 12-hour turn the 50-in. blooming mill of the Carnegie Steel Co., Donora, Pa., rolled 656 tons of steel slabs. During the week one of the 50-ton open-hearth furnaces made 13 heats.

ATLANTIC CITY MEETING

Of The American Society for Testing Materials—The Program.

The eighth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., June 29 to July 1. As previously announced, the Society for the Promotion of Engineering Education will hold its annual meeting in affiliation with the other society. Thursday evening will be devoted to a joint session of the two societies. At one session the sections on cement and preservative coatings will hold separate meetings simultaneously.

The International Association for Testing Materials has sent out the following notice:

"We beg to inform you that the organization committee at St. Petersburg gave us notice last December that His Majesty the Czar, owing to the present state of affairs in Russia has graciously consented to abandon the idea of holding the fourth congress there this year and has been pleased to invite the association to convene the fifth congress in Russia. The council at its last meeting at Vienna therefore resolved to accept, at the last minute, the invitation to go this year to Brussels. Subsequently great difficulties arose for holding the congress *this year in Belgium*, whilst for *the next year* such decided promises were given by the Belgian government and private circles that the congress in 1906 seemed sure of great success. To these difficulties came the unexpected loss of our beloved president. Under the painful impression of this catastrophe the council decided to abandon the idea of holding the fourth congress this year, to regard it as a year of mourning, and to profit by the above mentioned invitation to convene the fourth congress in Brussels 1906."

Since the last congress held in Buda Pesth, in 1901, the American Society has remitted nearly two thousand dollars to the International Association for which the American members have received practically no returns. After careful consideration the Executive committee has decided to recommend that suitable measures be taken by which hereafter membership in the International Association be left to the individual option of American Society members. It is accordingly proposed to amend the by-laws as follows:

Present By-Laws.

ARTICLE I.

Section 1. Any person, corporation or technical society holding membership in the International Association for Testing Materials is eligible for membership.

Sec. 2. Any person, corporation or society can become a member of this society and of the International Association for Testing Materials simultaneously upon being proposed by two members of this society and being approved by its executive committee.

Sec. 3. Any member who subscribes annually the sum of fifty dollars ($50) toward the general funds of the society shall be designated a contributing member, his rights and privileges as a member remaining unchanged.

ARTICLE IV.

Section 2. The annual dues of each member shall be $5.00. Of this amount $1.50 shall be transmitted by the secretary to the International Association for Testing Materials. The remainder shall be applied to the treasury of the society.

Proposed Amended Form.

ARTICLE I.

Section 1. Any person, corporation or technical society can become a member of this society upon being proposed by two members and being approved by the executive committee.

Sec. 2. Any member who subscribes annually the sum of fifty dollars ($50) towards the general funds of the society shall be designated a contributing member, his rights and privileges as a member remaining unchanged. Contributing members shall be exempt from the regular membership dues.

ARTICLE IV.

Section 2. The annual dues of each member shall be $5.00. Members holding membership also in the International Association for Testing Materials shall pay annually the additional sum of $1.50, which shall be transmitted by the secretary to the International Association.

The above proposed amendments will be presented at the annual meeting.

The program of the Atlantic City meeting is as follows:

First session, Thursday, June 29, 3 p. m. Business meeting.

1. Minutes of the seventh annual meeting.
2. Annual report of the executive committee.
3. Proposed amendment of the by-laws.
4. Report of Committee K: On standard methods of testing. Gaetano Lanza, chairman.
5. Report of Committee O: On uniform speed in commercial testing. Paul Kreuzpointner, chairman.
6. Report of Committee P: On fire-proofing materials. Ira H. Woolson, chairman.
7. Report of Committee Q: On standard specifications for the grading of structural timber. Herman von Schrenck, chairman.
8. Election of officers. The ballot accompanying this circular may be signed and mailed to the secretary, or it may be voted at the meeting. The ballot will close at 4 p. m.
9. Miscellaneous business.

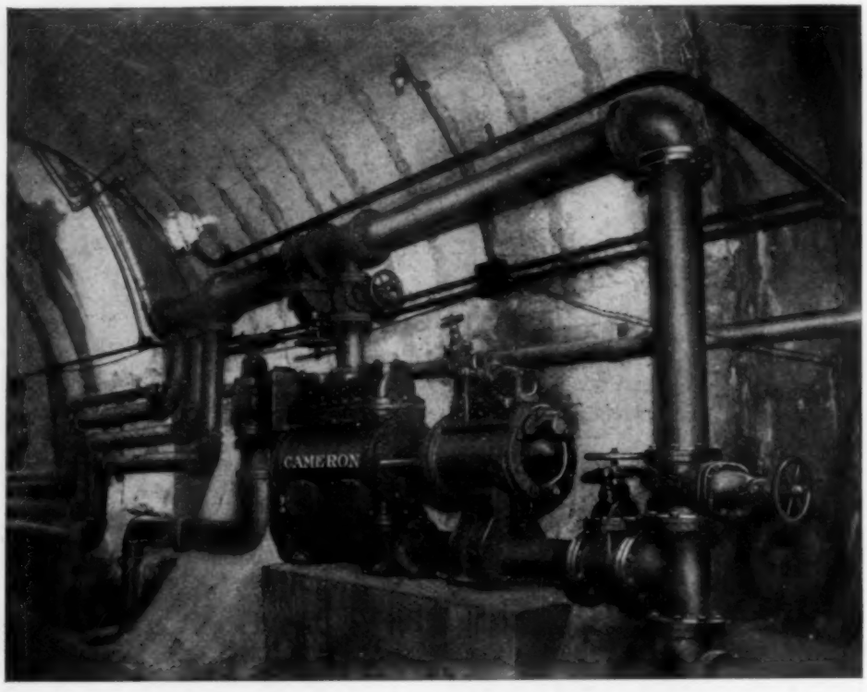

FIG. 2—ANOTHER VIEW OF SUBWAY PUMP EQUIPMENT.

Second session, Thursday, June 29, 8 p. m. Joint meeting with the Society for the Promotion of Engineering Education.

10. Annual address by the president: The Testing Engineer.
11. A Course of Laboratory Instruction in Testing Materials. W. K. Hatt.
12. A Course in Properties of Materials. G. L. Chritensen.
13. Plan and Scope of the Proposed Investigation of Structural Materials Under the Auspices of the U. S. Geological Survey. J. A. Holmes and Richard L. Humphrey.
14. Miscellaneous business.

Third session, Friday, June 30, 10 a. m. Separate meetings will be held at this session by the sections on Cement and Preservative Coatings.

On Cement.

15. Report of Committee C: On Standard Specifications for Cement. George F. Swain, chairman.
16. Report of Committee I: On Reinforced Concrete. F. E. Turneaure, chairman.
17. The Collective Portland Cement Exhibit and the Results of the Tests Made at the World's Fair, St. Louis, Mo. Richard L. Humphrey.
18. Normal Consistency Tests of Neat Cement. Topical discussion to be introduced by R. S. Greenman.
19. Economical Mold for Forming Compressive Test Pieces for Concrete. Clifford Richardson and C. N. Forrest.
20. Slow-pulling, Early-stage Rotary Portland Cement vs. the Ordinary Early-strength-developing Product. W. A. Aiken.
21. British Standard Specifications for Cement, with introduction by R. W. Lesley.
22. Impact Tests of Asphalt Paving Mixtures. Clifford Richardson and C. N. Forrest.
23. Miscellaneous business.

On Preservative Coatings.

24. Report of Committee E: On Preservative Coatings for Iron and Steel. S. S. Voorhees, chairman.
25. Report of Committee N: On Standard Tests for Lubricants. W. M. Davis, chairman.
26. Standard Specifications for Preservative Coatings for Steel. Topi-

cal discussion to be introduced by C. B. Dudley, Robert Job, A. H. Sabin, Maximilian Toch and Cyril de Wyrall.
27. Proper Methods in Conducting Painting Tests. G. W. Thompson.
28. Protection of Iron and Steel Structures by Means of Paper and Paint. Louis H. Barker.
29. What is the Best Method of Painting Steel Cars? Topical discussion to be introduced by F. P. Cheesman, G. W. Thompson and S. M. Evans.
30. Miscellaneous business.

Fourth session, Friday, June 30, 2 p. m. On Iron and Steel.

31. Report of Committee A: On Standard Specifications for Iron and Steel. W. R. Webster, chairman. This report will embody the proposed revised standard specifications on: a, Structural steel for bridges; b, Steel rails; c, Steel castings; d, Steel axles, e, Steel forgings.
32. Some Causes of Failure of Rails in Service. Robert Job.
33. Report of Committee M: On Standard Specifications for Staybolts. H. V. Wille, chairman.
34. Influence of Methods of Piling Staybolt Iron on Vibratory Tests. H. V. Wille.
35. A Preliminary Report on Tests of Nickel Steel and Carbon Steel Under Combined Stresses. E. L. Hancock.
36. Miscellaneous business. The evening of Friday, June 30, will be left open. Arrangements will probably be made for an informal smoker.

Fifth session, Saturday, July 1, 10 a. m. On Cast Iron.

37. Report of Committee B: On Standard Specifications for Cast Iron and Finished Castings. Walter Wood, chairman. This report will embody the proposed standard specifications for (1) car wheels and (2) gray-iron castings.
38. A Comparison of Standard Methods of Testing Cast Iron. Richard Moldenke.
39. Hard Cast Iron: The Theory of One of its Causes. Henry Souther.
40. The Thermite Process in American Practice. E. Stuetz.
41. Miscellaneous business.

Sixth session, Saturday, July 1, 2 p. m. Miscellaneous subjects.

42. Report of Committee G: On the Magnetic Testing of Iron and Steel. J. Walter Esterline, chairman.
43. Report of Committee H: On Standard Tests of Road Materials. L. W. Page, chairman.
44. Report of Committee R: On Boilers. E. D. Meier.
45. A Large Hydraulic Testing Machine for Uniform Loads. Robert A. Cummings.
46. Specifications for Cotton Tapes for Electrical Purposes. R. D. De Wolf.
47. Rail Sections as Engineering Structures. P. H. Dudley.
48. Miscellaneous business.

The *Canadian Engineer*, published at Toronto, beginning with the issue of June 1, 1905, will be issued under new auspices; both as regards ownership and the editing of its columns. The paper is now owned by the Monetary Times Printing Co., which also publishes several other trade papers. Biggar-Samuel, Ltd., were the former publishers. Under the new regime Thomas Robertson will be president, James Hedley, vice president, and Edgar A. Wills, secretary and treasurer. Samuel Groves will be editor. He is an expert in metallurgical science and was 1904 lecturer on "Mines, Furnace and Foundry," at the Carnegie Technical Schools, Pittsburg.

THE NEW DRAPER LATHE.

The modern conditions of manufacturing have so changed the demands upon machine tools that the older patterns are already fast becoming obsolete, and in no department is this more noticeable than in lathes. The higher rate of surface speed permissible with the tool steels at command, calls for a multiplicity of speed changes in order that at all diameters the cutting rate may be kept at approximately the desired speed. The design should also be such as to permit the application of a motor drive without radical changes in construction, so as to use the 2 to 1 variable speed motor, or with the growing use of alternating current motors which are constant speed and at present are not recommended as variable speed machines, a sufficient number of mechanical speed changes are necessary. The patent geared head lathe, made by the Draper Machine Tool Co., Worcester, Mass., combines these desirable features in a very pleasing manner.

The halftones show the 18-in. patent geared head as arranged for a belt drive. This lathe is driven by a wide face

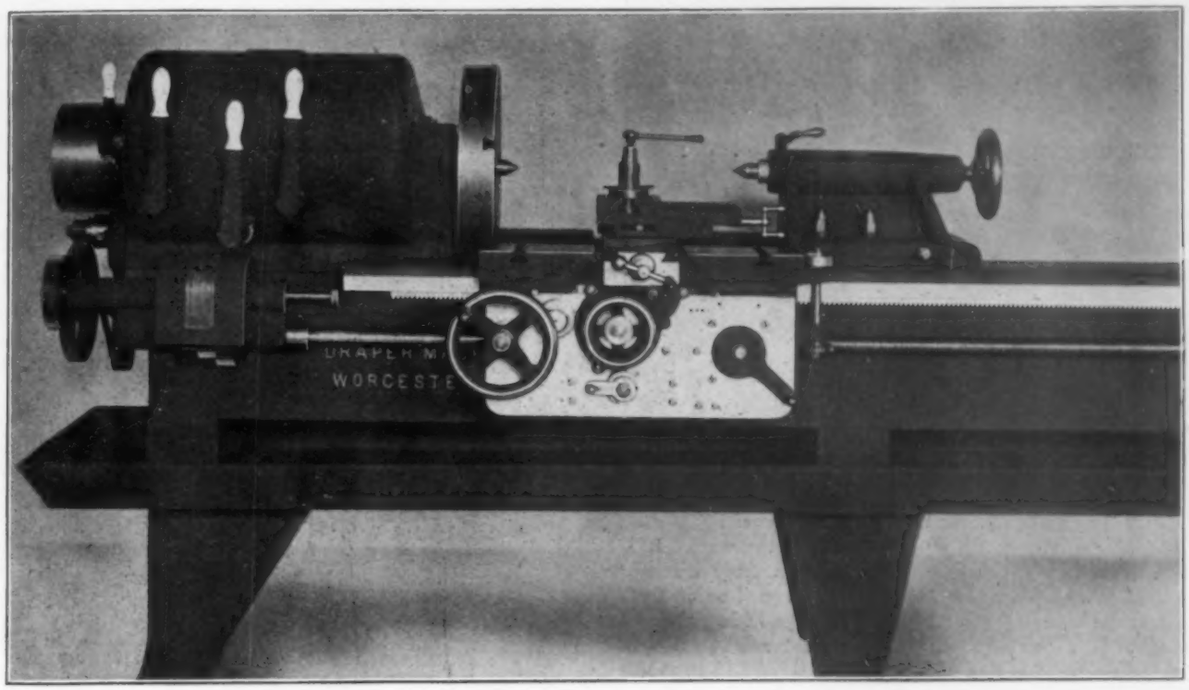

FIG. 1—THE DRAPER 18-IN. PATENT GEARED HEAD LATHE.

pulley with a 6-in. belt, giving 10 geared speeds to the spindle obtained by sliding gears, operated by the levers shown, and is ruggedly constructed to withstand severe duty, having ample power for heavy reduction or fast cutting speeds for finishing cuts. There is also shown an interior view of the head with the cover removed. The method of operation is made quite plain by these views.

The driving shaft is at the back of the lathe and has two sliding gears, operated by the middle lever at the front of the head. These gears mesh in either one of the two gears shown on the sleeve running loose on the main spindle. The front countershaft with its four gears is operated as is the back gear shaft on a common lathe. By throwing out these gears with the eccentric, and locking the spindle train with the knob shown in the cut, two rates of speed are obtained. With the spindle gears disconnected and the front countershaft or back gear shaft thrown in mesh there are eight more spindle speeds, making ten in all, with the single speed countershaft or the constant speed motor.

The belt driven lathe is usually furnished with the two

speed countershaft which in this case gives twenty forward working speeds to the spindle, and in order to avoid the complication of a backing belt the dial thread indicator seen at the right of the carriage is furnished, permitting all screw pitches regularly cut to be readily caught without a backing belt.

The pan formed head makes a very rigid construction, and also forms a reservoir which permits the gear train to run in oil. This design favors the wearing qualities, and reduces frictional losses.

The outline drawing of the end view of the head shows with what facility the lathe is changed to motor drive. The cover with brackets for the mounting of the motor is substituted for the plain cover and a train of gears or chain drives introduced from the armature shaft to the driving shaft on which the

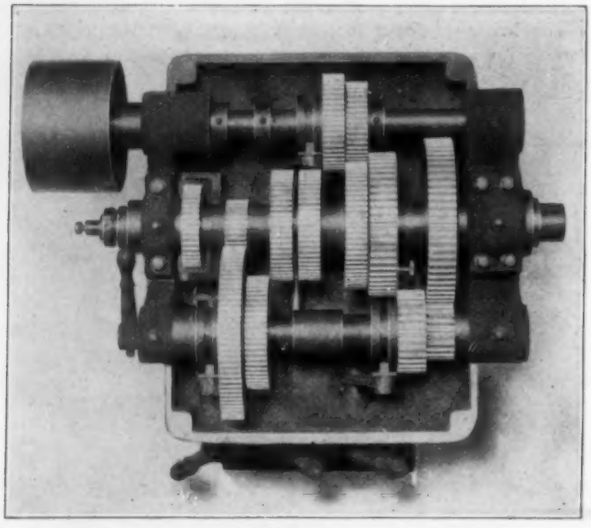

FIG. 2—INTERIOR VIEW OF THE PATENT GEARED HEAD.

pulley is ordinarily mounted at the back of the lathe, this being all the change necessary on the head frame.

The tailstock has extra long bearings on the ways. It is well ribbed and braced, has set-over screws, large diameter spindle, and is held by four bolts. The forward ones are as close to the end as possible to counteract the lifting strain of the cut. The carriage is very heavy and substantial with wide bridge, and has long bearings on the ways, and is usually furnished with compound rest having long movement to top slide. The apron is of box form and is securely fastened to the carriage, giving all shafts having severe duty bearings on each end. The inner bearing of the back pinion is securely bolted to the carriage at the point where it engages in the rack. The lathe as illustrated gives three changes of feed, or screw pitches, without change of gears. This lathe can be made with the Draper quick change feed in the apron giving forty changes of feed or screw pitches without change of gear. The illustration of the lathe shows it with pan. This is frequently furnished with the lathe owing to the greater amount of work that can be obtained with the high speed tool steels when using a lubricant. The lathe, however, is made with or without pan as desired. This lathe is also made with double independent block with set-over to front lock for splitting the cut, when desired. The patent geared head is furnished on all sizes of Draper lathes from 18 to 42-in. swing inclusive.

D. Lamond & Son, engineers and contractors, Pittsburg, are at present building the improved C. H. Foote fire brick blast furnace stoves at Iron Gate, Va., for the Allegheny Ore & Iron Co., at Standish, N. Y., for the Delaware & Hudson Co., and at West Duluth for the Zenith Furnace Co.

STEEL RAIL MILL

Of the Dominion Iron & Steel Co. in Operation—Other Canadian News.

Toronto, Canada, June 20.

The steel rail mill of the Dominion Iron & Steel Co., of Sydney, N. S., is now in operation, the first rail being turned out on June 14 in the presence of a number of officials and experts. The machinery worked in a perfectly satisfactory manner. Among those in attendance was J. P. Sandberg, a British steel rail expert, acting in the interests of the Grand Trunk Pacific Railway, for which the first order of rails will be filled. The mill begins operations with orders for about 70,000 tons of steel rails, including the contract for 25,000 tons for the Intercolonial Railway recently secured, the larger portion of the balance being for the Grand Trunk Pacific.

A rumor to the effect that the Canadian Shipbuilding Co., which has just acquired the Bertram Engine Works of this city, was negotiating for the purchase of the Collingwood Shipbuilding Co.'s works is denied on behalf of the former company. Those conversant with the situation, however, would not be surprised if a change of ownership of the Collingwood works should follow shortly.

The Dennis Wire & Iron Co. of London, Ont., which recently contemplated leaving that city, having been offered strong inducements to locate elsewhere, has definitely decided to remain in London. Some prominent citizens have interested themselves in the concern, which will be incorporated as a joint stock company with a largely increased capital. A new factory 160 by 72 ft. and two stories high will be erected on Dundas street, giving greatly increased capacity. The contracts have been let and the new building is expected to be complete by the end of August.

The Hamilton (Ont.) Bridge Co. has secured the contract

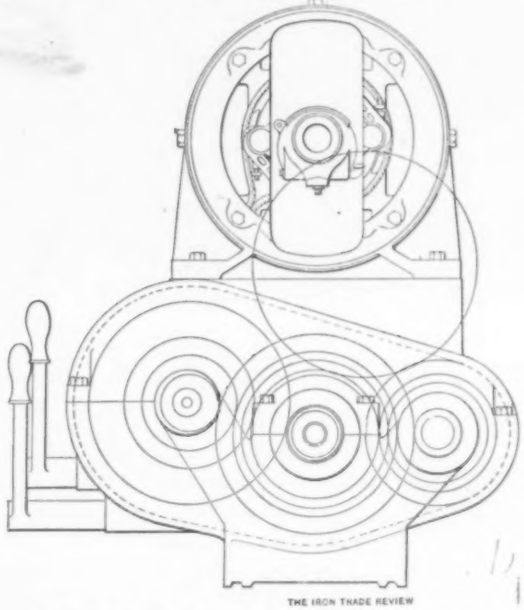

FIG. 3—END VIEW OF HEAD WITH MOTOR DRIVE.

for the steel work on the new Traders' Bank building of fifteen stories—the first genuine skyscraper to be built in Toronto. The steel work is to be completed by Dec. 1.

The Helen iron mine in the Michipicoten region is producing iron ore at the rate of more than 1,000 tons daily, over 30,000 tons having been already shipped this season. The sinking of a new shaft has given access to a fine bed of ore 400 feet below the original bed.

The new plant of the Nova Scotia Coal & Steel Co. at Sydney Mines, N. S., including four open hearth furnaces, is

expected to be in active operation early in July. The building containing the open-hearth plant cost $78,000 and the cost of each furnace was $100,000.

The Imperial Steel & Wire Co., of Collingwood, Ont., paid its first dividend last week.

The Ontario government has named W. H. Plummer of Sault Ste. Marie, as the successor of N. W. Rowell on the directorate of the Consolidated Lake Superior Co. to represent the interests of the province. W. H. Hearst, of Sault Ste. Marie has been appointed legal agent of the government as regards its relations with the company.

The following companies have been incorporated under the laws of Ontario; Chatham Steam Heating Co., Limited, head office, Chatham; capital, $40,000; provisional directors, Geo. W. Kipp, Edward Whalen, Joseph T. O'Keefe, Wm. N. Warburton and Nathan H. Stevens.

Russell Elevator Co., Ltd., head office, Toronto; capital, $20,000; provisional directors, John Russell, Agnes Russell and Charles Q. Parker.

The Macdonald Engineering Co., incorporated under the laws of Illinois, has been authorized to do business in Ontario on a capital not exceeding $50,000.

ACQUIRED ANOTHER PLANT.

Independent Pneumatic Tool Co., Chicago, Branching Out.

The Independent Pneumatic Tool Co., of Chicago, recently acquired the Aurora Automatic Machinery Co., of Aurora, Ill., builder of the Thor piston air drills, pneumatic riveting, chipping, calking, and beading hammers piston air motor hoist, pneumatic saws and other air appliances. The general offices

PLANT OF INDEPENDENT PNEUMATIC TOOL CO.

of the Independent Co. are located at the First National Bank Building, Chicago, Ill., and the Eastern offices at 170 Broadway, New York City.

The officers of the company are as follows: James B. Brady, president; W. O. Jacquette, first vice president; John D. Hurley, second vice president; A. B. Holmes, secretary; C. E. Erikson, treasurer; A. Levedahl, mechanical superintendent. The board of directors consist of the following: James B. Brady, W. O. Jacquette, John P. Hopkins, John D. Hurley, Simon Florsheim, John M. Glenn, J. J. McCarthy, C. E. Erikson, Louis B. Dailey. Mr. Simon Florsheim is chairman of the board of directors.

The accompanying illustration shows the works of this company at Aurora, Ill. It is equipped with the very latest improved machinery, and at present, has a capacity of about 100 pneumatic tools a month. The makers claim that the Thor pneumatic tools are in use in a large number of plants in all parts of the world, and are giving entire satisfaction.

The new furnace at Woodward, Ala., is nearly completed and will be blown in at an early date.

THE SARGENT STEAM METER.

The demand for a practical device which will measure or indicate to the observer the weight of steam flowing through a pipe has led to the invention of the Sargent steam meter, an instrument which will indicate the weight of steam or horse power irrespective of the pressure. To determine the amount of steam used by an engine, a steam turbine, a heating plant, a drying kiln, or in fact, any department of industrial works a test is often necessary; and while it can be done when the whole amount of steam can be condensed, by the installation of expensive and complicated apparatus, the cost of such determinations is often prohibited. If the steam is condensed in water or by a jet condenser the only way to determine the quantity is by weighing the water before evaporation, which, on account of using the boiler output for other service, is usually impracticable. The Sargent steam meter is an instrument which indicates the weight of steam passing through

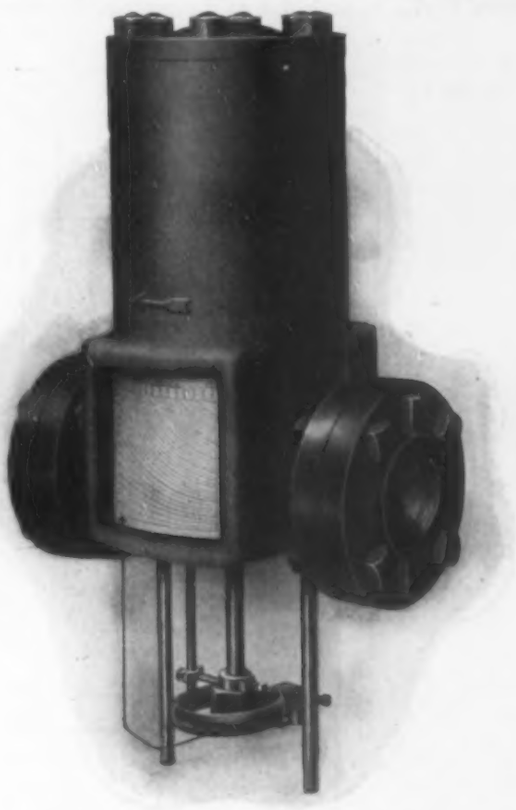

FIG. I—THE IMPROVED FORM OF THE SARGENT STEAM METER.

a pipe, with any pressure within the limits of the device; and as this instrument is calibrated by weighing the steam passing through after condensing same in a surface condenser, the indications in service must coincide with the indications determined in calibrating the meter, as the pointer necessarily has a different position for different quantities of steam flowing through, and also a different position for different pressures. A meter carefully calibrated must be correct when used in practice. The original device was discussed at a meeting of the American Society of Mechanical Engineers and described in *The Iron Trade Review* of Dec. 15 and 29, 1904.

Fig. 1 shows the improved form of the Sargent steam meter. It is connected up in the steam pipe or by-pass, which allows all the steam that is to be measured to pass through, and this amount is indicated by the position of the needle on the dial. Meters are made right and left, so that when looking at the

dial the steam may flow towards the right or left as purchaser desires.

Fig. 2 is a sectional elevation of the meter showing the passage of the steam and the moving parts. Steam enters from the left, and rising up around the valve stem guide, passes through the small hole p, and as the pressure increases raises the valve i, allowing the steam to pass down between the two cones and the valve seat to the discharge side of the meter. As the valve stem k is open to the atmosphere, the pressure on the discharge side of the meter tends to close the valve and force it to its seat. As the area of the valve stem is about 2 percent of the valve area, there will be a 2 percent difference in the pressure between the outlet and inlet side of meter, and to maintain the difference the valve will assume new positions, depending on the quantity of steam flowing through. If the steam pressure were constant the rise of the valve would be in proportion to the weight of steam flowing through, but as the pressure increases more

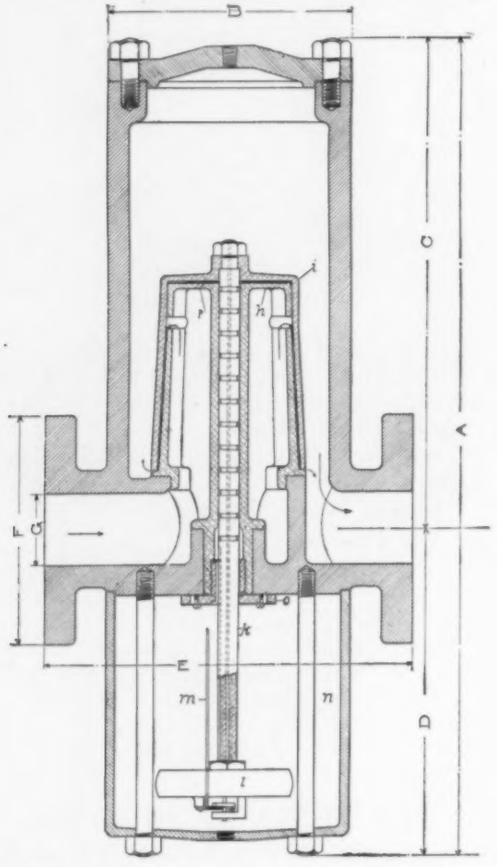

FIG. 2—SECTIONAL ELEVATION OF STEAM METER.

steam will go through a constant opening; or what necessarily happens, as the weight remains constant the opening will be less as the pressure increases. In order to compensate for variations in pressure a Bourdon Spring, Fig. 3, is connected to the bottom of valve stem and moves the needle transversely as the pressure varies. With a constant weight of steam flowing through, the valve would be open twice as wide for 50 lbs. pressure than it would be for 100 lb. pressure, from which we see that the horse power lines go down as the pressure goes up. The meter is calibrated by weighing the condensed steam flowing through under different pressures and valve openings, and the trial dial thus obtained is transferred to the permanent metal dial of the meter. As the meter has but one moving part it is not liable to get out of order.

The meter is manufacturing in sizes 1 to 6 in. by the Sargent Steam Meter Co., First National Bank Building, Chicago.

CAR ORDERS VERY HEAVY

Great Activity Among Eastern Pennsylvania Blast Furnaces.

HARRISBURG, June 20.—With exception of the Lancaster county furnaces in the lower Susquehanna valley almost all of the blast furnaces available for operation in Eastern Pennsylvania are at work. The activity is greater than for years and the tonnage of iron is mounting high.

The independent skelp and bar mills in this part of the state are not doing much this month, but there is more inquiry and the prospects are that there will be placing of some orders soon. Car works and those plants supplying car making material are running night and day to get out rush orders, chiefly for the Japanese government and for railroad and coal companies, the latter line of business being exceptionally heavy. The Berwick and Milton car works of the American Car & Foundry Co., and the Middletown Car

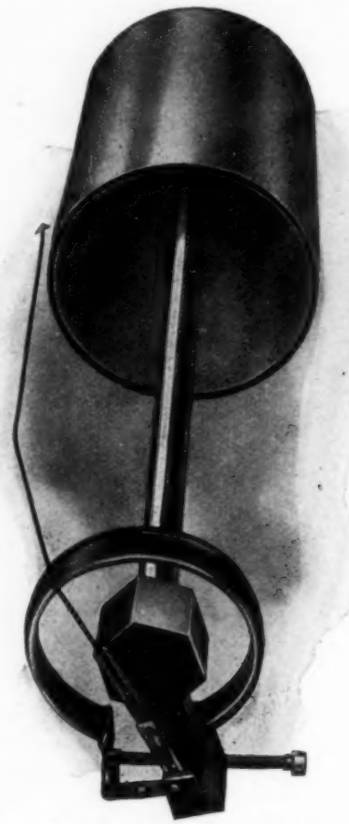

FIG. 3—THE BOURDON SPRING.

Works, an independent plant, have increased their forces and are operating some departments at night to get their orders filled. Shipments to the Pacific coast are also large, it is reported.

The Harrisburg Foundry & Machine Works has booked orders for a 700-h. p. 4-valve Fleming engine for the East River Electric Co., of Bluefield, W. Va., and for large engines for the Pennsylvania railroad shops at Pitcairn and the Keokuk Electric Power Co., of Keokuk, Iowa. Another Harrisburg concern that has been prosperous with large orders is the Harrisburg Mfg. & Boiler Co., which is completing shipments of pipe for Mexican mining operations and for similar use at Rockwood, Col.

Juniata furnace at Newport, Perry county, has been started.

York concerns have been taking orders for machinery for South American ports and also have some inquiry for Panama orders.

CONTRACTORS' SINKING PUMP.

This pump may be suspended vertically from a chain or fixed on timbers during the progress of making excavations. It is a suitable pump for any situation where there is a varying level of the water to be pumped. It is very compact, with all parts easily accessible. The piston can be packed by removing the upper head of cylinder and sliding the follower up the piston rod. All valves are exposed by removing one plate. The suction pipe is suspended vertically from the lower side of water chest. All pipes are easily connected or disconnected. The discharge pipe is screwed into a companion flange that has hinged bolts.

The steam valve gear is of simple and reliable form. Its principle is like that of a duplex pump. The steam chest is simply an auxiliary slide valve engine. The main piston rod communicates motion through levers to the three port valve

A NEW SINKING PUMP.

in the steam chest which admits and exhausts the steam to and from the chest piston. This auxiliary engine moves the valve controlling the steam in the main cylinder. Thus, it will be seen that the large piston moves the valve that actuates the auxiliary engine and the small piston the valve that actuates the main engine, the two acting precisely on the principle of a duplex pump. It has close clearance, and, therefore, uses steam economically. The stroke is adjustable and not variable. Both the steam and auxiliary valves are flat slides. The motion of the auxiliary steam slide valve is continuous, like that derived from an eccentric. The ports leading to the chest piston are closed except at the moment the main piston is being reversed, hence there can be no waste of steam in case the chest piston becomes worn. The stroke of the pump can be instantly changed by moving the stud in the slot at the upper end of the lever. This fine adjustment permits the reduction of clearance to a minimum (no matter how old the pump) and causes it to operate at full stroke with the least possible consumption of steam. This steam valve gear is noiseless; it has no dead center, and will start automatically at any point of the stroke; the auxiliary valve, having a long stroke and rapid motion gives a prompt reversal of the piston at the proper time; there can be no waste of steam incident to the wearing of chest piston; it is durable and positive, and it can not short stroke. These pumps are made in fifteen sizes and for a great variety of situations, and are manufactured by the Dean Bros., Steam Pump Works, Indianapolis.

HORIZONTAL NOTCHING PRESS.

We illustrate a horizontal press of new design. This is fitted with indexing or spacing attachments for perforating metal rims. The press has a capacity for handling work 96-in. diameter and for spacing or indexing divisions from 160 to 1,600. The indexing mechanism is fitted with a worm gear and worm, it being claimed that this form of driving mechanism eliminates, to a large degree, the inaccuracies usually caused by the momentum in revolving large discs. The worm and gear are cut and machined on large tools made particularly for this purpose. The worm runs in an oil tight box and is immersed in lubricant. The first driving shaft is fitted with a locking disc which also serves as a ratchet wheel. This wheel is positively locked at each stroke of the press or revolution of the crank shaft, instantly on the release of the driving pawl.

PRESS FOR PERFORATING METAL RIMS.

The change gears are conveniently attached in such a manner that they can be easily and quickly removed and various combinations effected to obtain the different spacings required. Only one locking disc is furnished and by means of the adjustable crank head, connected by rod to the locking disc plate, one or more notches may be used in spacing, in this manner reducing the number of change gears to obtain the different divisions. By means of this adjustable head and the change gears, combinations may be effected for a great variety of spacing and with accurate results. The machine was designed and built by the Toledo Machine & Tool Co., of Toledo, for a special line of steam turbine work.

President J. W. Duntley, of the Chicago Pneumatic Tool Co., of Chicago, on his return from Europe where he spent six weeks in the interest of the company, reports the trip the most successful he has ever experienced. He says that, owing to the growing demand for pneumatic tools in England and on the continent, it was found necessary to extend the organization of the foreign business. In order to accomplish this the factory and business of E. G. Eckstein, Berlin, Germany, and that of the Lencke Co., St. Petersburg, Russia, were purchased and will be operated for the purpose of meeting these requirements in the continental countries. Mr. Duntley predicts the electric drill is destined to rival the air drill and open a field which heretofore could not be solicited.

GREAT GROWTH

OF IRON AND STEEL PRODUCTION IN THE UNITED STATES

As Shown in the Annual Report of Manager Swank for 1904.

Advance sheets of the annual statistical report of the American Iron and Steel Association, compiled by James M. Swank, general manager, indicate that it will be the most complete collection of iron and steel statistics relating to the United States that has ever been compiled. The new volume contains 136 pages against 94 last year, and much information not heretofore collected is included. The price tables are especially elaborate. The summary statement was published last week in *The Iron Trade Review*. Some further abstracts are now published as follows:

TOTAL PRODUCTION OF COKE.

The following table, compiled by the Division of Mining and Mineral Resources of the United States Geological Survey, gives the total production of coke in the United States from 1881 to 1904. Prior to 1880 complete statistics of the production of coke are not available. Since 1896 our production of coke has in some years doubled, while that of coal has doubled since 1894.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1881	4,113,760	1889	10,258,022	1897	13,288,984
1882	4,793,321	1890	11,508,021	1898	16,047,209
1883	5,464,721	1891	10,352,688	1899	19,668,569
1884	4,873,805	1892	12,010,829	1900	20,533,348
1885	5,106,696	1893	9,477,580	1901	21,795,883
1886	6,845,369	1894	9,203,632	1902	25,401,730
1887	7,611,705	1895	13,333,714	1903	25,262,360
1888	8,540,030	1896	11,788,773	1904	23,621,520

PRODUCTION OF BESSEMER PIG IRON FROM 1887 TO 1904.

The production of Bessemer pig iron was not separated statistically from other pig iron until 1887. Since that year it has been as follows, in gross tons. Low-phosphorus pig iron is included in the figures given for 1901, 1902, 1903 and 1904.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1887	2,875,462	1893	3,568,598	1899	8,202,778
1888	2,637,859	1894	3,808,567	1900	7,943,452
1889	3,151,414	1895	5,623,695	1901	9,596,793
1890	4,092,343	1896	4,654,955	1902	10,393,168
1891	3,472,190	1897	5,795,584	1903	9,989,908
1892	4,444,041	1898	7,337,384	1904	9,098,659

UNSOLD STOCKS OF PIG IRON FROM 1874 TO 1904.

The following table gives the stocks of unsold pig iron in the hands of manufacturers or under their control in warrant yards and elsewhere at the close of each year from 1874 to 1904. Stocks in second hands in warrant yards are not included.

Years.	Production.	Unsold stocks.	Per cent. stocks.	Years.	Production.	Unsold stocks.	Per cent. stocks.
1874	2,401,262	710,521	29.58	1890	9,202,703	608,921	6.61
1875	2,023,733	679,382	33.57	1891	8,279,870	596,333	7.20
1876	1,868,961	613,213	32.81	1892	9,157,000	506,116	5.52
1877	2,066,594	573,528	27.75	1893	7,124,502	662,068	9.29
1878	2,301,215	513,004	22.29	1894	6,657,388	597,688	8.97
1879	2,741,853	126,495	4.61	1895	9,446,308	444,332	4.70
1880	3,835,191	407,730	10.63	1896	8,623,127	711,649	8.25
1881	4,144,254	188,300	4.54	1897	9,652,680	656,489	6.80
1882	4,623,323	383,655	8.29	1898	11,773,934	291,233	2.47
1883	4,595,510	476,607	10.37	1899	13,620,703	63,429	0.46
1884	4,097,868	529,464	12.92	1900	13,789,242	442,370	3.20
1885	4,044,526	371,886	9.19	1901	15,878,354	70,647	0.44
1886	5,683,329	225,629	3.97	1902	17,821,307	49,951	0.28
1887	6,417,148	301,913	4.70	1903	18,009,252	591,438	3.28
1888	6,489,738	300,144	4.62	1904	16,497,033	408,792	2.47
1889	7,603,642	247,679	3.25				

PRODUCTION OF IRON AND STEEL WIRE RODS SINCE 1888.

The following table gives the production of iron and steel wire rods from 1888 to 1904. Prior to 1888 wire rods were not separately classified in our tables. Gross tons are used.

Calendar years.	Iron rods.	Steel rods.	Total. Gross tons.	Calendar years.	Iron rods.	Steel rods.	Total. Gross tons.
1888	13,010	266,759	279,769	1897	2,019	968,717	970,736
1889	12,911	350,940	363,851	1898	2,106	1,069,577	1,071,683
1890	17,677	439,422	457,099	1899	808	1,035,590	1,036,398
1891	13,623	522,984	536,607	1900	1,929	844,362	846,291
1892	15,422	612,407	627,829	1901	475	1,365,459	1,365,934
1893	1,125	536,147	537,272	1902	206	1,574,087	1,574,293
1894	5,772	667,630	673,402	1903	30	1,503,425	1,503,455
1895	2,840	788,290	791,130	1904	1,166	1,697,862	1,699,028
1896	2,473	621,513	623,986				

PRODUCTION OF BASIC AND ACID OPEN-HEARTH STEEL IN THE UNITED STATES AND GREAT BRITAIN.

The following table gives separately the production of basic and acid open-hearth steel ingots and castings in the United States from 1896 to 1904 as compared with the production of basic and acid open-hearth steel ingots only in Great Britain during the same period, the production of open-hearth steel castings in Great Britain not being statistically ascertained.

Years.	Basic ingots and castings.		Acid ingots and castings.		Total—Gross tons.	
	United States.	Great Britain.	United States.	Great Britain.	United States.	Great Britain.
1896	776,256	172,287	522,444	2,145,268	1,298,700	2,317,555
1897	1,056,043	208,088	552,628	2,393,718	1,608,671	2,601,806
1898	1,569,412	216,088	660,880	2,590,512	2,230,292	2,806,600
1899	2,080,426	294,688	866,890	2,735,563	2,947,316	3,030,251
1900	2,545,091	293,484	853,044	2,862,566	3,398,135	3,156,050
1901	3,618,993	351,177	1,037,316	2,939,614	4,656,309	3,290,791
1902	4,496,533	406,780	1,191,196	2,676,508	5,687,729	3,083,288
1903	4,734,913	510,809	1,094,998	2,613,274	5,829,911	3,124,083
1904	5,106,367	662,064	801,799	2,583,282	5,908,166	3,245,346

PRODUCTION OF TINPLATES AND TERNE PLATES.

In the following table we give the production of tinplates and terne plates in the United States from July 1, 1891, to December 31, 1904, the production in 1902, 1903 and 1904 being partly estimated from the best available sources of information. The production of tin dipping plants is included.

Calendar years.	Gross tons.	Calendar years.	Gross tons.
1891 (last six months)	999	1898	326,915
1892	18,803	1899	360,875
1893	55,182	1900	302,665
1894	74,260	1901	399,291
1895	113,666	1902	360,000
1896	160,362	1903	480,000
1897	256,598	1904	458,000

PRODUCTION OF CRUCIBLE STEEL INGOTS AND CASTINGS BY STATES FROM 1875 TO 1904.

Years. Gross tons.	Pennsylvania.	Other States.	Total.	Years. Gross tons.	Pennsylvania.	Other States.	Total.
1875	23,764	11,416	35,180	1890	54,009	17,166	71,175
1876	25,194	9,969	35,163	1891	53,716	18,870	72,586
1877	24,985	11,113	36,098	1892	64,834	19,875	84,709
1878	27,308	11,001	38,309	1893	51,704	11,909	63,613
1879	38,941	11,755	50,696	1894	39,257	12,445	51,702
1880	50,961	13,703	64,664	1895	49,889	17,777	67,666
1881	59,188	20,957	80,145	1896	43,107	17,582	60,689
1882	58,160	17,813	75,973	1897	51,521	18,438	69,959
1883	56,863	14,972	71,835	1898	69,244	20,503	89,747
1884	37,764	15,506	53,270	1899	75,528	25,685	101,213
1885	40,883	16,716	57,599	1900	67,422	33,140	100,562
1886	55,172	16,801	71,973	1901	74,204	24,309	98,513
1887	58,719	16,656	75,375	1902	85,483	27,289	112,772
1888	52,960	17,319	70,279	1903	75,437	26,997	102,434
1889	56,592	19,273	75,865	1904	60,815	22,576	83,391

PRODUCTION OF BLACK PLATES, OR SHEETS, FOR TINNING.

The following table gives the production of black plates, or sheets, for tinning in the United States in the calendar years from 1894 to 1904. Prior to 1894 we did not separately classify the statistics of the production of black plates, or sheets, for tinning. The figures for 1899 and 1900 are in part estimated.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894	52,359	1898	345,254	1902	365,743
1895	129,615	1899	375,000	1903	490,652
1896	185,387	1900	315,000	1904	472,569
1897	271,886	1901	398,026		

PRODUCTION OF IRON AND STEEL STRUCTURAL SHAPES.

In the following table we give the production of structural shapes from 1892 to 1904. Prior to 1892 structural shapes were not separated from other rolled products in our statistics.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1892	453,957	1897	583,790	1902	1,300,326
1893	387,307	1898	702,197	1903	1,095,813
1894	360,305	1899	850,376	1904	949,146
1895	517,920	1900	815,161		
1896	495,571	1901	1,013,150		

PRODUCTION OF CUT AND WIRE NAILS FOR 19 YEARS.

In the following table we give the production in kegs of 100 pounds of standard sizes of cut nails and spikes cut from plates from 1886, the year of maximum production, to 1904; also the production of all sizes of wire nails for the same period. Prior to 1889 statistics of the production of wire nails were not collected by the American Iron and Steel Association. For the three preceding years the statistics given are careful estimates.

Years.	Kegs of 100 pounds.			Years.	Kegs of 100 pounds.		
	Cut nails.	Wire nails.	Total.		Cut nails.	Wire nails.	Total.
1886	8,160,973	600,000	8,760,973	1896	1,615,870	4,719,860	6,335,730
1887	6,908,870	1,250,000	8,158,870	1897	2,106,799	8,997,245	11,104,044
1888	6,493,591	1,500,000	7,993,591	1898	1,572,221	7,418,475	8,990,696
1889	5,810,758	2,435,000	8,245,758	1899	1,904,340	7,618,130	9,522,470
1890	5,640,946	3,135,911	8,776,857	1900	1,573,494	7,233,979	8,807,473
1891	5,002,176	4,114,385	9,116,561	1901	1,542,240	9,803,822	11,346,062
1892	4,507,819	4,719,524	9,227,343	1902	1,633,762	10,982,246	12,616,008
1893	3,048,933	5,095,945	8,144,878	1903	1,435,893	9,631,661	11,067,554
1894	2,425,060	5,681,801	8,106,861	1904	1,283,362	11,926,661	13,210,023
1895	2,129,894	5,841,403	7,971,297				

Warner & Swasey Co's. Addition.

The Warner & Swasey Co., Cleveland, Ohio, has broken ground for a large addition to its works, including new offices. The new section of the main building will be 55 x 240 ft. and five stories high above the basement. It will be of fireproof construction and most modern in every particular. A complete new power plant is also to be provided. These additions will practically double the present capacity. Contracts were let some time ago, and the work is to be completed in the early fall.

The Pittsburg Bridge & Iron Works, Pittsburg, which was recently organized, is pushing work on the erection of its new plant at Rochester, Pa., and expects to place it in operation about July 1. The company purchased a site of five acres and is erecting a building 90 x 200 ft. The plant will have an output of 750 tons a month of all kinds of structural steel for mill buildings, roof trusses, columns, girders, bridges, coal tipples and plate and tank work of all kinds. A large amount of material will also be carried in stock. The officers of the company are George E. Klingelhofer, president; C. H. E. Succop, secretary and treasurer; and L. F. W. Hildner, engineer. The offices of the company are located at 341 Sixth avenue, Pittsburg.

LAKE SUPERIOR IRON MINES.

Increased Use of Steel on Ore Roads—Crusher Plant Tested.

The Duluth, Missabe & Northern road is to build large car shops at Duluth, and has been receiving bids therefor. These shops are to be large enough and heavily enough equipped to handle all the repairs on steel cars. The extended use of pressed steel cars of late years has made necessary complete change in car repair shop equipments and the northwestern ore roads, which are rapidly reaching the point where their entire equipment is of steel, will have to remodel their shops. The Duluth began this work when its old shops were burned last winter, and now the Missabe has undertaken the same operation. The Great Northern road has been doing the same and its shops at Superior will, before long, be completely modified to suit changed conditions.

The new crusher plant at the Richmond mine, Cascade range, has been tested by its owners, the Consumers Ore Co., and is found quite satisfactory. This crusher was installed in less than two months and is of sufficient size to crush all the ore the company will want from the Richmond mine. The first cars have been delivered at the mine and shipments have commenced. G. M. Baker, who put in this plant, has gone to the Mesabi range, where he will have charge of the installation of a large machinery plant.

The Winston-Dear Co. now has three shovels at work night and day on the stripping at the Monroe mine at Chisholm. They give employment to about 200 men. The Drake & Stratton Co. is now operating but one shovel at the Leonard mine, the stripping being nearly completed.

The Stephens mine, east of Biwabik, Minn., is now shipping 4,000 tons a day, which is the best work the mine has ever done. It is a very large and well opened property.

Two mining deals have been closed in Duluth and in one of them the Northern Pacific Railway Co. becomes heavily interested by leases under which it will spend large sums in developing work begun at four points on the Cuyuna range.

With an equipment of one steam shovel, two new 35-ton locomotives and the necessary cars, work has been commenced on the stripping of the Utica mine, located about two miles west of Hibbing, adjoining the Mahoning on the South. The Utica is one of the Hibbing properties owned by Pickands, Mather & Co., of Cleveland, and is superintended by Robert Murray. The overburden is of varying depth and its removal will require considerable work. The stripping is being done by the owners.

Oglebay, Norton & Co.'s new Welch mine near Commonwealth, Wis., Menominee range, has started to hoist ore. Shipments will begin as soon as a spur track now being constructed by the Chicago & Northwestern road is extended to the property. A force of about 100 men is now employed.

The world's record for handling ore with a steam shovel has been broken at the Steel Corporation's Hull mine at Hibbing. In five hours and thirty-six minutes, 138 30-ton cars were loaded from a stockpile, or a total of 4,140 tons. Loading from stockpile is considered more difficult and slower than loading from an open pit, for the reason that time must be taken oftener for moving the shovel, and also to clean up the scattered ore. It is figured that the loading of these 4,140 tons of ore cost the Steel Corporation less than one cent per ton, exclusive of the cost of any wear and tear to the shovel. One of the best day's work on record was made by steam shovel crews employed by the same company in the Burt pit last summer, when in twenty-four hours three shovels loaded from the pit something like 18,000 tons or over.

W. N. Rowe, who has held the position of master mechanic at the Adams-Spruce mine since December, 1902, has been tendered a similar position at the Hibbing mines of the Steel Corporation. Mr. Rowe has decided to take up the work in the larger field.

NEWS FROM MANY INDUSTRIES.

New Buyers :—

The Newport Foundry & Machine Corporation, Newport R. I., has been incorporated with $15,000, capital stock. The incorporators are: Robert Francis, Edward L. Spencer and Eliza M. Peckham, all of Newport. The corporation has been formed for the purpose of buying and selling real estate, vessels, and steamboats, manufacturing and dealing in boilers and engines, machinery, etc.

The South Texas Development Co., Albany, N. Y., has been incorporated to lease or develop any lands within or without this state containing coal, iron or oil. The directors are Frederick Tillinghast, Charles H. Sabin, Ledyard Cogswell, Robert C. Pruyn, John E. Walker, of Albany; E. K. Dillingham, of Houston, Texas; Edward H. Cady, of Cleveland.

The Semi-Steel Castings Co., Detroit, Mich., has been incorporated with $10,000 capital stock. The stockholders are: Joseph G. Johnston, Patrick H. Sullivan and Arthur E. Annesley.

The Rockford Match & Machine Mfg. Co., Rockford, Ill., has been incorporated to manufacture machinery, etc. The incorporators are: Nelson J. Russel, F. E. White, D. W. Parker and F. S. Righeimer. The capital stock is $150,000.

The Seaboard Electric Co., Norfolk, Va., has been incorporated to deal in electrical supplies, dynamos and other electrical machinery. The incorporators are: A. L. Bosley, president, Baltimore; J. W. Little, vice president, Atlanta; J. Binford Jr., secretary and treasurer, Richmond. The maximum capital stock is $50,000; minimum, $5,000.

E. B. Rich & Sons. Chicago, have been incorporated with $15,000, capital, by Pohan Waage, John S. Stevens and Gilmer Gilbreath to manufacture machinery and tools.

The T. H. Forrest Machine Co., Chicago, has been incorporated with $2,500, capital stock, by T. H. Forrest, Emil Widemer and A. E. Widemer.

The Pittsburg Railway Supply Co., Pittsburg, has been incorporated for the manufacture of journals, journal boxes, roller bearings and other railway appliances. The capital stock is $10,000. The directors are: Michael B. Kelly, Frederick G. Ward Chas. R. Buchheit, Eugene S. Reily and James P. Kelly, Pittsburg.

The Gregory-Whitlock Lath Machine Co., Richmond, Va., has been incorporated by R. K. Gregory, president, Greensboro, N. C.; C. D. Whitlock, secretary and treasurer, Richmond, Va. The maximum capital stock is $30,000; minimum, $15,000. The company intends to secure by purchase machines for making laths, and to build and operate factories for making such machines, etc.

The Adams Co., of Dubuque, Ia., has purchased the Hotel Paris, of that city, and as soon as the lease of the present holder runs out, will remodel the building for foundry purposes.

The Aurora Foundry Co., of Aurora, Ill., is erecting an addition to its plant, 70 by 70 ft.

The Hayes Mfg. Co., of Erie, Pa., will erect two new buildings, one of which is to be a foundry.

The Chicago Hardware Foundry Co., of North Chicago, Ill., is making several extensions and additions to its plant.

A brass foundry department will be added to the plant of the Pittsburg Valve & Fittings Co., of Barberton, O.

The North Lebanon Foundry Co., of Lebanon, Pa., which was organized about April 1, has its new buildings well under way and expects to be in operation about July 1.

The Globe Iron Foundry Co., of Johnstown, Pa., has found it necessary to increase its equipment to keep pace with its rapidly growing business. A new cupola and electric crane and some additional equipment are to be added.

The Sheffield Cast Iron Pipe & Foundry Co., Sheffield, Ala., has awarded a contract to Harry B. Austin for the construction of its buildings.

The St. Albans Foundry & Implement Co., of St. Albans, Vt., is enlarging its plant and installing new machinery to enable it to manufacture a special line of gasoline engines.

Fires :—

Fire of unknown origin damaged the plant and contents of the Milwaukee Boiler Co., Milwaukee, Wis., to the extent of $4,500. Of the loss, $3,500 is sustained on the building and about $1,000 on contents. This is wholly covered by insurance.

A part of the plant of the Peck, Stow & Wilcox Co., East Berlin, Conn., was destroyed by fire, throwing 150 hands out of work and entailing a loss which is conservatively estimated at $35,000. The plant was built about 35 years ago and was running on full time in the manufacture of tinners' and machinists' tools. Repairs will be made as soon as possible.

New Construction:—

The Hendey Machine Co., Hartford, Conn., has awarded contract to the Torrington Building Co. for the construction of a new addition, 214 x 110 ft., two stories high brick and steel construction.

The Wm. J. Oliver Mfg. Co., Knoxville, Tenn., has purchased land and will build a new car wheel factory adjoining its present plant. The contract will be let about Aug. 1.

The Aldine Mfg. Co., Grand Rapids, Mich., has awarded contract for a plant to cost about $30,000; to consist of three buildings for office, manufacturing and foundry purposes. The manufacturing building will be 50 x 125 ft., two stories and basement; the foundry will be one story 56 x 88 ft., and all will be ready for occupancy by Jan. 1.

Wm. Wharton Jr., & Co., Inc., Philadelphia through Ballinger & Parrot, architects, have completed plans for a two story fireproof pattern shop and storage building 60 x 247 ft. at the corner of Twenty-fifth and Ellsworth streets, Philadelphia.

The annual meeting of directors and officers of the Western Tube Co. held at Kewanee, Ill., June 7, and reports for the year show the company has done a prosperous business, and additions to the plant will be made in a short time. The following directors were elected: A. M. Hewlett, Kewanee; C. E. McCullough, Kewanee; John Duncan, Kewanee; Wm. D. Schiller, Pittsburg; John D. Culberston, Pittsburg. The officers continue as before, being: President, A. M. Hewlett; vice president and general manager of sales, John Duncan; secretary-treasurer, C. E. McCullough.

The Iler Rock Drill Mfg. Co., Denver, Colo. has filed article of incorporation and will erect a $75,000 machine shop on Blake street between Thirteenth and Fourteenth streets, Denver. The concern will devote itself exclusively to the manufacture of pneumatic hammer mining hand drills, invented by Franklin M. Iler. Frank Mulvaney, of Cripple Creek; Joseph M. Maxwell and F. M. Iler are mentioned as the directors of the company in the incorporation papers.

Enos Bros. are planning to build a new foundry at Waterloo, Ia.

Davis, Stewart & Co., of Lowell, Mass., are building an addition to their foundry 30 by 40 feet.

The Olds Motor Works and the Olds Gasoline Engine Co., of Lansing, Mich., whose respective plants join each other, are about to commence the construction of a foundry which will cost $125,000.

The Sheffield Cast Iron Pipe & Foundry Co., of Sheffield, Ala., has a large force of men engaged in the construction of its new plant.

The Mason Heater & Foundry Co., of Bellaire, O., has its

new plant in successful operation, the first castings having been made June 8.

The La Crosse Plow Co. is making improvements in its foundry at La Crosse, Wis., which will cost about $7,000.

The plant of the Record Foundry & Machine Co., at Livermore Falls, Me., is to be extended.

W. F. Trimble & Sons have a contract for the erection of a one-story brick foundry for the Pittsburgh, Fort Wayne & Chicago R. R. Co., in Allegheny, Pa., the building to cost $20,000.

The Illinois Foundry & Engineering Co., of Granite City, Ill., has just completed a structure of steel construction which gives the company 4,000 feet of additional floor space for pattern storage. It also reports that business is extremely good and that it has a large number of orders on its books for the future.

The Conway Steel Range Co., of Toledo, O., expects to increase the capacity of its plant by erecting an $8,000 addition.

General Industrial Notes:—

L. S. Colyar, of Chattanooga, has purchased from T. F. Burbank, L. S. Ledbetter and Col. J. A. Peck their valuable piece of mineral property south of Cedartown, Ga.

The Lawrence Mfg. Co., Boston, at the annual meeting, June 13, the retiring board of directors was re-elected with the following officers: T. Jefferson Coolidge, president; Clifton P. Baker, treasurer, and Fred A. Wilcox, clerk. The annual reports were read and approved, but not made public, and only routine business was transacted.

The Bessemer Coal, Iron & Land Co. has purchased the property and leases of the Wind Rock Co., of Knoxville, Tenn., as part of an extensive development scheme on the part of the Bessemer company. The land includes 2,500 acres of mineral land, a spur track and mining buildings. The mines have recently been put in good operation.

The Sloss-Sheffield Steel & Iron Co. has declared the regular quarterly dividend of 1¾ percent on the preferred stock, payable July 1.

The Davis-Hansen Co., Oshkosh, Wis., reports that its recent fire caused a loss not to exceed $500.00, and the damage of the machinery and buildings was slight.

The Algoma Steel Co., Ltd., Sault Ste Marie, Ont., recently completed a contract for 4,000 tons of 100 lb. rails for the Michigan Central Railway to be used on their lines in Canada.

The Penn Bridge Co., of Beaver, Pa., has bought at auction the plant of the South Pittsburg Iron Works, at Claysville, for $28,310.

The entire property of the Fleetwood Foundry & Machine Co., of Fleetwood, Pa., with the exception of one building previously sold, has been disposed of to J. W. Johnson, of Reading Pa., and Ephraim Hartman, of Oley.

At the annual meeting of the stockholders of the South Baltimore Steel Car & Foundry Co., Baltimore, Md., the directors were re-elected for the coming year. Howard Carlton has been elected president and Chas. T. Crane as chairman of the board.

The Standard Iron Works, of Prescott, Ariz., has amended its charter, changing the name to the Prescott Iron Works, and making such other changes in the charter as were necessary for the transaction of its business. The company was formerly located in Phœnix, Ariz.

Brown & McKie, owners of the Boundary Iron Works, of Grand Forks, B. C., are turning their business into a joint stock company with a capital of $25,000. The firm started business three years ago in a small way, but has been very successful.

The Harrisburg Clay Co. has been granted a charter by the State of Pennsylvania and will operate a large plant at Mt. Holly, Cumberland county, where it has valuable clay rights. The office of the company will be in Harrisburg and it will make a specialty of various kinds of brick.

DEATH OF GEORGE A. GRAY.

On Wednesday morning, June 14, George A. Gray, former president of the G. A. Gray Co., of Cincinnati, manufacturer of planers, died suddenly of heart trouble at his home on Reading road, near Dickson street. He had been suffering from that disease for some time, but on the Tuesday night preceding his death he was apparently in better health than usual. Early on Wednesday morning he failed to answer a call to breakfast and a member of the family upon investigation, found him dead in his bed. Mr. Gray was 66 years of age and was born near Hillsboro, Ill. He came to Cincinnati many years ago and was one of the pioneers in the machine tool industry. Mr. Gray with Messrs. Gaff and Gordon formed the Niles Tool Works and he was connected with the concern for some time after its removal from Cincinnati to Hamilton. He was the founder of the G. A. Gray Co., and was the active head of that concern until four months ago when he retired on account of ill health. The active management of the business was left in charge of men who had been associated with him in the company for years. His business associates feel deeply

GEORGE A. GRAY.

the loss they have sustained. Mr. Gray was a mechanical genius and was rated among the leading mechanical engineers of the country. He was modest and retiring in disposition. He was interested in church affairs and was prominently identified with the building of the St. Paul's Cathedral House, the parish house in connection with the Episcopal Cathedral in Cincinnati. His effort in connection with this building was one of the last of his activities in church affairs and one in which he took deep interest. He is survived by two children, Wallace M. and Elizabeth F. Gray.

During the month of May the open-hearth plant of the Carnegie Steel Co., Donora, Pa., produced 33,000 tons of steel. This plant contains twelve 50-ton furnaces and during the month one was idle the greater part of the time. The best daily output was 1,670 tons and one furnace produced 73 tons at a single heat.

Four of the new Talbot open hearth steel furnaces, at the Southside works of the Jones & Laughlin Steel Co., Pittsburg, are now in operation, and the fifth will be completed and ready for operation in about six weeks.

THE ENGINEER AS AN ECONOMIST.*

BY C. J. H. WOODBURY, A. M.

The prevailing direction of the work of the modern engineer has trended towards applications to the welfare of private individuals rather than to that of the government, especially in its military relations. Life has been extended and health improved in the congestion of cities largely by the general installation of systems of water supply and sewerage; while, in the further concentration of employment, forced ventilation has rendered mines healthy and made the modern crowded office building a sanatorium, and in like manner added to the efficiency of the labors of the occupants. Artificial refrigeration is a marked instance of the economy of engineering science applied to the general welfare, in its frugal checking of waste and its extension of the variety as well as improvement in food supplies.

An early indication of the segregation of industry into manufacturing appears to have been the separation of cloth making from the household to what eventually became a mill, where the production of this new industry made clothing more abundant because of its lesser cost, until there was a surplus.

Invention has followed invention, until the contributionship of machinery has reduced the cost of the product.

The first mill in the world where cotton was converted into finished goods exclusively by machinery driven by power was at Waltham, Mass., where a certain grade of sheeting, costing in 1816 30 cents a yard, has since been sold at 4¾ cents a yard.

The hours of labor have diminished nearly one-third, and the daily wages have increased enormously.

The amount of mental force applied to these engineering problems is beyond conception, as their results transcended estimate. It has raised millions of employees above what might have otherwise continued to be virtually conditions of serfdom. It has better clothed millions of human beings, and yet human toil is so cheap in the less favored countries that three-quarters of the people of the world wearing cotton goods are believed to use hand-spun cloth; for the products of cotton mills which are sent to the Orient and the tropics do not penetrate far from lines of water transportation, the commercial limit of land transportation being in many instances only fifty miles where these goods equal the competition of hand labor. In woolens the rate of improvement has been comparable, except that the relative cost of the raw material forms so much larger proportion of the finished product that the final differences are not so marked in degree.

The first cost of the stock has been modified by the utilization of woolen cloth as a raw material, which has permitted the cheaper production of warmer clothing; although shoddy has a bad name, it enters into the composition of the finest broadcloth.

Many of the handicrafts made as good work by hand as is now produced by machinery. The finest cotton goods in the world are still hand spun in India, the Gobelin tapestries are still incomparable, and printing was from the first equal to modern standards. I have a "horned" Bible of 1676 (so called from an error in cornuatum for coronatum in Exodus XXXIV), which is well printed on good paper, gilt edges, and bound with spring back, yet it is stated to have cost in its day an amount equal to fifteen years' wages of a laborer; and, being in Latin, few but the clergy could read it.

The essential element of the prosperity of our civilization has been the development of both internal and foreign communication, which brought forth the fundamental inventions and the methods of construction necessary for the establishment of steam navigation and the steam railway as channels for commerce.

One should not be too boastful to claim that an invention has reached the highest possible development, lest he should repeat the history of a United States patent examiner in 1836, who felt so sure, from the opportunities of his position, that the resources of the human mind had been exhausted by invention, that he was one of the few Federal officials who voluntarily resigned their positions; and he resumed his old profession of portrait painting, where he was sure of a livelihood as long as vanity and solvency existed in the same individual.

Fundamental pioneer engineering work has been done for so long and to such an extent that the constructive problems have been solved; both principles and methods have been set forth in numerous books, giving every phase of engineering experience of the past, followed by the engineering journals of today, so that the precedents are matters of accessible record, whose technical principles may be applied by any one possessed with training in the apprenticeship of the subject, although the commercial relations, now as always, require an experienced mind.

The wider insistence for the luxuries of civilization has made them a necessity, and these betterments must be supplied to a greater number; and in the same spirit there is a demand for a reduction of the time of labor; therefore, to meet these conditions costs of operation must be reduced, and the efficiency of productive methods increased. The highest problem of the engineer has ceased to be how to do things, for that is well known, but it is how to do them cheaply; the problems are fundamentally those of economics.

Remembering that every saving of weight and space devoted to machinery and coal gives a similar accommodation for cargo, the combined result of the substitution of propeller for side wheels, high-pressure steam, compound engines, and redesigning of the lines taken from sailing vessels to those suited for iron steamships, the aggregate economies have reached to the enormous extent that the combustion of a ton of coal now transports across the Atlantic thirty-two times as much cargo as fifty years ago; and the mercantile world is awaiting with interest the result of the renaissance of the original rotary engine in its modern application in the form of the steam turbnie for the propulsion of vessels.

The engineering problem of today is a financial problem; it is not merely to build and to operate, for both are common knowledge in regard to almost every type of work, but it is how to build with lowest reasonable conditions of annual cost of the investment, and how to operate with lowest reasonable conditions of annual expenditure; and neither of these problems may require the fewest dollars, but perhaps demand amounts beyond the dreams of avarice. Depreciation from wear and tear forces itself into engineering problems as surely as human mortality into actuarial work; and, beyond, this, the iconoclasm of sudden impairment from subsequent invention in the unknown future threatens like a sword of Damocles.

As a simple instance of an engineering problem in economics, take that of the pipe from a large pump to deliver a certain number of gallons a day into a reservoir. The cost of such pipes of several diameters laid in the trench may readily be estimated, and the annual charge of interest and depreciation ascertained, also the annual interest on the cost of excavating and filling the trench; these items would give the annual cost of installation of pipes of several diameters, which would be clearly the least with the smallest pipe. The other element is that of the annual cost of pumping the water, which would be the greatest with

*From an address given at the commencement exercises of the Thomas S. Clarkson Memorial School of Technology, Potsdam, N. Y., June 9, 1905. Mr. Woodbury, of Boston, Mass., is assistant engineer with the American Telegraph & Telephone Co.

the smallest pipe and the least with the pipe of the largest diameter, on account of the lesser friction with the larger pipes. While this data might be equated and the minimum solved by the calculus, the average engineer is generally far enough from his school days to plot the two sets of data on cross-section paper, the one above the other, and quickly determine the result graphically from the curve with far more accuracy than that of the formula from which was computed the friction of the water forced through the pipe.

This pipe problem suggests another occurrence which is frequent in engineering work. The pipe may leak, but it may cost less to suffer the waste by leakage than to excavate and repair; there are many leaks which are lesser evils.

The regularity of operation is an important element in the productive work of a machine whose economy may be reduced by intermittent operation; but, in any event, fixed charges of rent, interest, depreciation from subsequent invention, and even to a certain extent the impairment of time, are essential considerations. For example, it is ordinarily cheaper to drive piles by machinery than by hand; and yet there are occasional instances where small amounts of work are to be done in places difficult of access, where it is necessary for the gang of men to work intermittently, either in moving the piles to their site or changing the position of machinery; and then, instead of waiting while the piles are driven by power, they may be employed in raising the hammer by the direct pull of a number of men, after the manner in which this work was done years ago.

A consideration of a steam engine plant solely on the basis of the cost of fuel would be short-sighted and extravagant, because those engines which are more economical in fuel are of a greater first cost, which will render the final results frequently excessive for irregular work.

In the case of a manufacturing establishment operated by water wheels, it frequently becomes necessary that provision be made for supplementary power, to be available during periods of drought; and it is a matter of simple estimate and computation to determine the class of steam power plant preferable for any conditions of affairs wherein the annual use of the engine may be an estimated factor, and the final results for a plant operating perhaps six weeks in the year may warrant only a cheaper type of steam engine and boiler, wasteful as to fuel, but economical as to its first cost and depreciation. On the other hand, if the steam from these boilers may be used advantageously for heating during a certain portion of the year, or for bleaching or dyeing continuously, this element of the problem may be modified; and if proposed extensions to the establishment in the near future will require a more extended use of this supplementary power, another element will be introduced into the problem which may warrant a more expensive plant, of the highest degree of steam economy.

In lubrication it frequently is advantageous to use greater quantities of oil for reduction in the power cost. It required many years for the textile interests to learn that free lubrication of spindles was more economical than a limitation in the quantity of oil, which lubricated, but with greater friction; yet this may not be accepted as a truism, as it is modified by the cost of power, whether it be from steam and measured by shovelfuls of coal, or whether from an ample water power, where the cost is not increased by raising the gate.

A manufacturer of an article by a chemical process in general domestic use, which made a competitive product not protected by either patents or by the tariff, and believing that it would be advantageous to introduce technical skill in the works, employed a professor of chemistry from a leading college, and was surprised that the professor did not give any attention to the main process, but began the most critical examination of the waste products, from which a number of substances of great value were obtained.

Railway transportation could not be established until the development of manufacturing stimulated the output of mines, and the necessity for their transportation and that of raw material and finished goods required cheaper means for moving these products in large quantities.

Steam transportation has not supplanted the need for horses, which inspired the farmers for that reason to make such attacks upon the surveying parties for the early English railways that pugilists were employed to pose as the head of the parties, and to act vigorously when the protests became more than verbal. Great as may be the amounts of material transported by railway, all of it, excepting that for export, is teamed at least twice, and much of it more than twice.

The wonderful mechanical engineering work which manufactured the American automatic machine-made watch is one of the modern triumphs of engineering economies. To such an extent has this type of automatic machinery been developed that a factory devoted to the manufacture of cheap but quite regular watches produces four watches a day for each employe, including everybody employed in the establishment for any purpose whatever, even the teamsters and night watchmen; and the price at which some very cheap watches are sold indicates a larger rate of production. Vast as may be the output of watches, their use is largely confined to those within easy range of railroad transportation. It is the need for their use, and not their cost, that makes the demand for watches, for no one need be prevented by cost from owning a watch of some grade.

The cry of modern life, like that of the dying Queen Elizabeth "Millions for a moment of time," has been fulfilled by the telegraph, sending its messages across continents and beneath seas to the uttermost parts of the earth; and by the telephone, which provides a path for the personal usage and its rebounding answer, which furnishes that conference essential to every commercial transaction. It bestows more than a saving in time, for it makes a creation of results. In the face of lavish investments the economies of the engineer have materially diminished the annual cost of telephone service, as well as improved its quality.

The economic demand is for time,—the one thing which mankind cannot control except by quicker transportation in its reduction of otherwise available time, and artificial illumination in the utilization of unavailable time. The more extensive introduction of illuminating gas has followed the result of economies by the united effort of engineers and chemists, primarily in the utilization of by-products, and later by fundamental economies in methods of gas generation.

Electrical illumination has been a new art wholly within the province of engineering, and, while its merits were fully appreciated from the first, yet the cost restrained its introduction from reaching a high percentage of development until the tributary expenses were reduced. In prime movers it extended the development of engine and boiler economies, it has encouraged the return to first principles in the steam turbine, and through its patronage of the impulse water wheel has applied a new art to the utilization of the energy of cascades half a mile in height in the far west, which had hitherto descended unvexed to the lowlands, and harnessed their power to useful work hundreds of miles distant.

An engineer is fundamentally a constructor and operator, while in an inventor the constructive sense is as apt

to be as deficient as his proverbial lack of commercial ability. The invention of the Bessemer process of making steel was one of the most brilliant productions which ever adorned the results of an inventor; yet it required the work of many engineers to reduce its cost until the product could be produced cheaper than wrought iron.

The changed conditions to which the rails of a certain railroad were subjected by the substitution of motors under each car, in place of one locomotive to a train, caused an alarmingly rapid wearing of rails, although of a type of steel which has been used satisfactorily for a long time, but under the new conditions of attrition these rails in some places would last only six weeks; but on the advice of an engineer, expert in the subject, rails of a different type of steel were substituted, and the new rails remain in good condition after two years' service.

The analytical method of the design of members in construction by applying the principles of mechanics, combined with the experience of test pieces as constants in the formula, is a characteristic of the economy of engineering in its prevention of unnecessary squandering of material, and, above all, an avoidance of the hazard of destruction from stresses to which the completed work may be subjected.

Another economy may be the attempt to provide for the inevitable result of depreciation from subsequent invention by avoiding the expenses of building for too long endurance, but in the expectation that other means will supplant those of the present, and to be prepared for a limited existence of the work. At the present time there is a great engineering work under construction in this country, in which the whole design is based upon an estimated endurance of fifty years. It is a credit and not a disparagement to our civilization that it does not promise to leave works of outlived purpose, like the pyramids, a wonderment to other civilizations.

In the "One Horse Shay," Dr. Oliver Wendell Holmes, as well as the good deacon, builded better than he knew; for it should not be considered merely as a logical triumph, but as an ideal of the accuracy of engineering calculations in correctly estimating the strength of each part, and exactly providing for the depreciation of the whole work.

The successful efforts in the settlement of America were all done by corporations, and the unsuccessful attempts at colonization which were not permanent were those made directly by governments, without the intermediary of local self-government for the control of the settlers. The greater strength of a number of persons combined for a unity of effort is not a subject for argument,—as an axiom it is old as Æsop's fable of the bundle of sticks; but its beneficial effects upon the individual, whether as a producer or as a consumer, have not been so fully set forth. The employment of large numbers is a necessity for extensive production, both of which are essential in connection with the needs of dense population, where there are many people to work and to live.

An extensive establishment must be a corporation, because its financing to bridge the gap between payments for the raw material and labor and the receipts for the product is beyond the resources of the individual, not to mention the large amounts to be buried in plant, which requires constant renewal in part. The employment of a large number by its segregation gives better opportunities to the individual, because the subdivision of work in its assignment according to personal qualifications gives to one more nearly the class of duties for which he is best fitted, and therefore, places him in harmony with his environment, and adds to personal efficiency of production both as to skill and celerity more than can be the case with a variety of duties, as under the completion of any course of work by one person. The shorter time of instruction for subdivided labor reduces the period of tutelage at lower wages to far less time than under the apprenticeship system, whose failures cannot be easily corrected in later life.

The history of those occupying places of responsibility in the service of corporation shows the extent to which the principle of selection and promotion has been used to fill vacancies. There have been no premiums on ignorance, but tools to him who can use them.

While it is properly the custom to refer to labor collectively as being made up of individual units, the same method should be used in regard to capital, which is made up of units whose ownership may be constantly varying. The capital in a corporation is a contributionship made up of many units, and, as the shares are almost universally on sale at competitive prices, their purchase is available in amounts suited to the resources of the purchaser; and to this extent they form industrial savings banks, frequently owned in a material part by those who also obtain their livelihood from the same source.

While partnerships are rarely available for those employed by a firm, yet a corporation affords opportunities for part ownerships, and proportional share in profits on the one condition of purchase in the open market.

The relationship between the many units forming the sustaining capital and the many units included in the productive labor joined in an enterprise may be likened to a tree, wherein the trunk between these two parts, each essential to the other, may represent the executive head necessary for both. These positions of headship require persons who can do many things, because they can do one thing at a time; and, having a sense to quickly reach logical results from information even outside of their personal knowledge, can therefore give generally correct directions and are endowed with executive capacity.

The methods of correct thinking towards results in the direction of just decisions appear to be developed through legal rather than technical training. Every executive action reflects an equivalent measure of responsibility, and the conservatism which these conditions inspire is shown in the high standard which pervades the conduct of large establishments.

Attention has been called to some of the events of the centuries whose cumulation raised mankind to receive higher conditions of welfare, also to the effort which initiated the means of producing improved conditions of life; and, furthermore, the later types of engineering skill, whose economies have extended these ameliorations to the benefit of larger numbers. It is evident that the future will be adorned with these betterments as richly as the past; but, beyond the contingencies of the production of new systems of engineering applications, there will still remain extending fields of work in the savings of wastes of time, labor and material. This type of modern engineering is largely due to technical education, whose results may not be ascribed so much to those of the departments of instruction directly applicable to practice as they have been to the inculcation of scientific principles and logical methods of procedure, thereby training powers of continuous application; and, above all, the spirit of technical institutions imbuing young minds with the inspiration of a definite purpose.

The Connecticut Valley Labor Bureau, Springfield, Mass., through its secretary, Frank A. Wilson, has issued an interesting and instructive pamphlet on "Methods of Conducting a Labor Bureau for Employers' Associations as Adopted by the Labor Bureau Secretaries' League." The organization consists of secretaries of all the leading labor bureaus and employers' associations in the eastern part of the United States.

SECRETARY DRURY

Of the National Supply and Machinery Dealers' Association.

J. H. Drury, who, since May 1, of the present year has been in active charge as secretary of the National Supply and Machinery Dealers' Association, with offices at 69-71 Frankfort street, Cleveland, with the Strong, Carlisle & Hammond Co., will be an alert figure in the trade. Until he came to Cleveland Mr. Drury for 29 years was with the Brown & Sharp Mfg. Co., Providence, R. I., in various capacities, but lastly as sales manager of the cutter and small tools department.

Since the formation of the National Supply and Machinery Dealers' Association the dealers as well as the manufacturers have seen the desirability of an association of this kind, as it appeals to every dealer in supplies as being of great importance in the development of the supply business.

Mr. Drury, who is a Providence, R. I., man by birth, is the

J. H. DRURY.

man to develop the association. He is active and energetic, knows the business thoroughly, and within a very short time the association will have 100 members on its roll. The officers of the association are: E. E. Strong, Strong, Carlisle & Hammond Co., Cleveland, president; W. A. Somers, Somers, Fitler & Tod, Pittsburg, first vice president; Alfred Marshall, Marshall & Huschart Machinery Co., Chicago, second vice president, and J. H. Drury, secretary-treasurer. The executive committee is composed of A. F. Brion, Peter A. Frasse & Co., New York; George Puchta, the Queen City Supply Co., Cincinnati; C. A. Strelinger, the C. A. Strelinger Co., Detroit, Mich., and Geo. I. McIntosh, McIntosh Hardware Corporation, Cleveland.

The trolley interests of Reading, Pa., which are consolidated under the name of the United Traction Co., have decided to erect a large power house near Reading. It will contain two large batteries and details will be worked out shortly. The company is adding large boiler capacity to its Seventh street plant and will also improve what is known as the Klapperthal plant.

DOUBLE CAPACITY OF COKE PLANT.

Riverview Coal & Coke Co., Property has Changed Hands.

The Southern Connellsville Coke Co. was organized at Pittsburg last week with a capital of $300,000. The new company has taken over the ovens, mines and coal acreage of the Riverview Coal & Coke Co. and assumes a mortgage indebtedness amounting to $700,000.

Under an arrangement made with the mortgage holders the time for making the first payment was extended for three years, and the total indebtedness is to be paid in 15 installments, the last payment to be made in 1923. This arrangement removes the necessity of issuing bonds. The plant now contains 222 ovens as well as 900 acres of coal land and 350 acres of surface property. The coking plant will be increased to 500 ovens during the summer and a crushing and washing plant will be erected. The officers of the company are: W. C. Magee, president of the Pickands-Magee Coke Co., president; Harry Whyel, Uniontown, Pa., vice president and general manager; I. W. Seaman, Uniontown, secretary and treasurer. In addition to the officers the directorate is composed as follows: Isaac H. Brownfield, Uniontown, Pa.; Thomas Morrison, Carnegie Steel Co.; S. F. Harry, Connellsville, Pa.; John Husband, Mt. Pleasant, Pa.; George Whyel, Uniontown, Pa.

Ohio Plant Will Start on Rails.

The rail mill of the Ohio plant of the Carnegie Steel Co., Youngstown, O., will operate on rails and billets after July 1, instead of sheet bars and billets as at present. The increased rail orders for shipment during July and August has made it necessary to operate the mill partly on rails as the rail mill of the Illinois Steel Co. is booked to the end of the year and the Edgar Thomson plant has specifications on its books for four months' operations. The rail mill at Youngstown has not operated since Oct. 17, 1903.

Big Order for Steel Ties.

The Bessemer & Lake Erie Railroad Co., one of the subsidiary railroad companies of the United States Steel Corporation, has placed an order with the Carnegie Steel Co., Pittsburg, for 10 miles of steel ties. The order amounts to about 2,100 tons. Seven miles of the new ties will be laid on a stretch of second track now being constructed in Butler County, Pa., while the remaining three miles will be distributed at different points where the traffic is heaviest.

At the annual meeting of the directors of the Westinghouse Air Brake Co., Pittsburg, A. L. Humphrey was elected general manager to succeed E. M. Herr, resigned. John F. Miller, secretary, was elected fourth vice president. The other officers elected are as follows: R. F. Emery, secretary and assistant treasurer, and E. A. Craig, auditor and assistant secretary. Mr. Herr, who resigned as general manager, was recently elected first vice president of the Westinghouse Electric & Mfg. Co., but retains his position on the board of directors of the Westinghouse Air Brake Co.

In order to protect the old name, the directors of the old Newcastle Bridge Co., which recently changed its name to the Central States Bridge Co., have filed articles for the incorporation of the Newcastle Bridge Co., with a capital stock of $1,000. The directors of the new company are' Eugene Runyan, Jacob E. Troyer and Jesse D. Smith.

The Central Iron & Steel Co., of Harrisburg, Pa., turned out 12,300 tons of steel plates at its rolling mills in May, making a record for the plant. The company is operating its open-hearth and blast furnace plants to capacity.

YALE & TOWNE EXHIBIT.

The Yale & Towne Mfg. Co. of Stamford, Conn., and New York, N. Y., had an elaborate display of its products at the American Railway Appliance exhibition held at Washington, D. C., in May, 1905. The illustration depicts a portion of the exhibit—the part devoted to the Yale & Towne triplex, duplex and differential chain blocks. These blocks are extensively used in machine shops, storehouses, round houses and general lifting work on the leading railroads. Among many others, the following: Pennsylvania railroad, New York, Central & Hudson River, railroad, Central Railroad of New Jersey, Erie railroad, Lackawanna & Western railroad, New York, New Haven & Hartford railroad, etc.

At the recent convention of the American Foundrymen's Association in New York, there were three exhibits of special interest. The Falls Rivet & Machine Co., Cuyahoga Falls, O., had in operation a Wadsworth core machine, which was in charge of George H. Wadsworth, the inventor. Thomas W. Pangborn & Co., New York City, dealer in foundry supplies, had on exhibit a Hanna shaker, Hammer core machine, Williamson vises, National corundum wheels, and several smaller articles. The shaker and core machine were in operation, power to drive them being derived from the hotel power plant. The Goldschmidt Thermit Co., New York City, had an exhibit of its products in the basement of the hotel which was in charge of William M. Carr, assistant to the vice president.

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CHAIN BLOCKS ELECTRIC HOISTS YALE LOCKS
ASK YOUR DEALER
THESE HOISTS may be Purchased from leading HARDWARE MILL & RAILWAY SUPPLY DEALERS throughout the WORLD.

YALE & TOWNE CHAIN BLOCK EXHIBIT AT THE RAILWAY APPLIANCE EXHIBITION, WASHINGTON, D. C.

At the annual meeting of the stockholders of the Kokomo Steel & Wire Co., Kokomo, Ind., the following officers were elected for the ensuing year: A. A. Charles, president; A. V. Conradt, vice president; John E. Fredrick, secretary; G. W. Charles, treasurer. The directors are: Richard Ruddell, C. C. Shirley, W. D. Parr, A. V. Conradt, Thomas Harris, John E. Fredrick, A. A. Charles and G. W. Charles, all of Kokomo, and Jacob Dick of Huntington. Thomas Harris was continued in the position of superintendent. Among the out-of-town stockholders were Jacob Dick and F. E. Wickenheiser of Huntington, James Flynn of Toledo, Ohio, and J. O. Henderson of Indianapolis.

DIE STOCK BUSHING.

The Bard adjustable bushing made by the Armstrong Mfg. Co., of Bridgeport, Conn., has some novel features. This bushing is fitted with hardened jaws which are moved to and from center by means of a cam plate, and by fastening the plate with the thumb screw, the jaws are firmly held in any desired position. The adjustable jaws make an excellent center for the pipe or rod, fit closely around the same and insure the cutting of a straight thread. Were it necessary, a crooked or drunken thread could be cut with this bushing as easily as with a ring bushing. When once attached to the die stock it can always remain there. It does away with the necessity of carrying a number of loose ring bushings, and saves the time now lost in hunting for and changing the bushing for each size of pipe. No more winding tin or paper around pipe or rod. This bushing can be furnished to fit the genuine Armstrong stocks and dies, Nos. 1, 2, 2½ and 3.

The Roe Stephens Mfg. Co., Detroit, Mich., announces its purchase from C. W. Thomas of the plant, equipment, and business of the Michigan Brass & Iron Works, Detroit. No change will be made in the management, and Mr. Thomas will remain as president of the new company. The Roe Stephens plant will be devoted to the manufacture of Scott pop safety valves, Goldsmith throttle valves, Scott gate valves, angle, globe and check valves, and steam specialties. The "Michigan Plant" will continue to manufacture a full line of fire hydrants., water gates, valve boxes, indicator posts, foot valves, air and relief valves, plain and indicator floor stands, etc.

The York Bridge Co. was awarded the contract for the contract for the construction of the new state bridge over the Susquehanna river at Sescopec, Pa., on Tuesday by the Pennsylvania State Commission of Buildings and Grounds. There were thirty bidders, including the leading bridge companies of Ohio, Pennsylvania and New York and the York company, which has offices at York, Pa., was given the contract at its price of $209,500. Steps are now pending for the advertisement for other contracts for state bridges, including one which will be larger than that awarded to the York concern.

PERFORMANCE OF A SUPERHEATER.*

BY A. BEMENT, CHICAGO.

This apparatus consisted of a Babcock & Wilcox boiler of approximately 5,000 sq. ft. of heating surface, of a height of fourteen tubes, and a Babcock & Wilcox superheater of approximately 1,000 sq. ft. of heating surface, served by a chain grate stoker with a grate area of 75 sq. ft., which discharged the gases of the fire from under an ordinary short ignition arch directly among the tubes of the boiler.

The diagrams shown are plotted from a large number of experiments. The great variation in capacity produced was due entirely to the size of the coal used by the stoker, and the amount of ash it contained. In calculating the work developed in the superheater, the specific heat of superheated steam was taken as 0.75, although a higher figure is probably nearer correct, as the steam pressure was 180 lb.

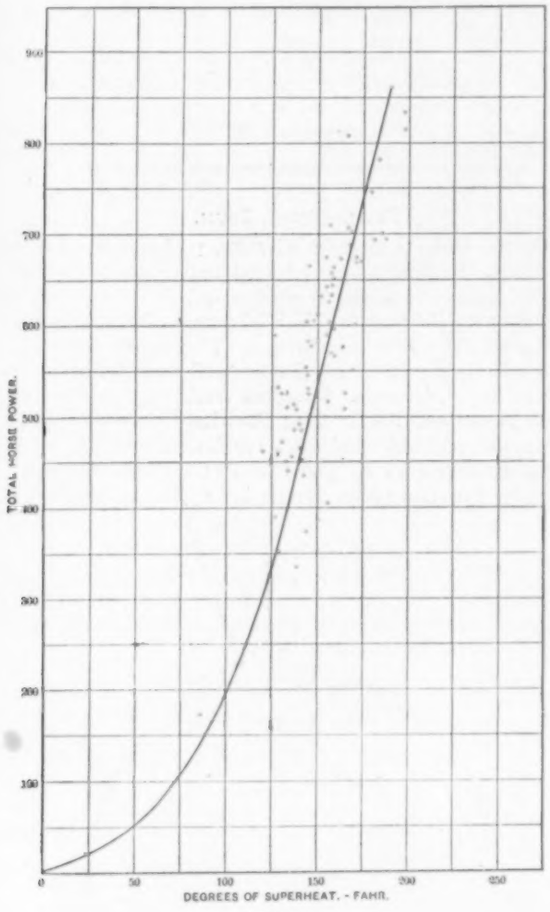

FIG. 1.

Fig. 1 shows relation of degree of superheat to total horsepower developed. It is apparent that the capacity increases at a much greater ratio than does the temperature of the steam, or, in other words, that the temperature tends in a measure to remain constant. For example, for ordinary ranges of capacity required in service, which may be taken as from 500 to 800 h. p., the temperature of superheat ranges from 145 to 182 degrees, indicating that this combination of boiler and superheater probably produces as uniform a degree of superheat as would be obtained from a direct fired superheater in usual service. Throughout the whole range of the experiments, the total horsepower varied by approximately 850 percent, while the degree of superheat varied by approximately 100 percent. The condition of combustion had much to do with the formation of this curve, because the large capacities were produced by the best coal, or, in other words, the coals of best size and greatest freedom from ash. It was, in fact, such fuels that made the large capacities possible, the largest horsepower being produced by coals specially selected, by screening out of a large quantity the most favorable sizes. For this reason, the condition of combustion was better as the horsepower increased, which produced a higher initial temperature, causing more heat to flow into the boiler and less to the superheater. Therefore, the tendency was for work done in the boiler to increase in much greater ratio than that in the superheater. This is well illustrated by the two tests between 100 and 200 h. p., which gave about 85 degrees of superheat, while that at 860 h. p. only gave a superheat of about 190 degrees. There is another possible reason why the temperature elevation is not greater at high capacity; it is the possibility of water being carried from the boiler by the steam into the superheater. If this does occur, it is a case where it is desirable for a boiler to produce wet steam.

Fig. 2 shows relation between horsepower produced in boiler and superheater. Fig. 3 gives relation of degrees of

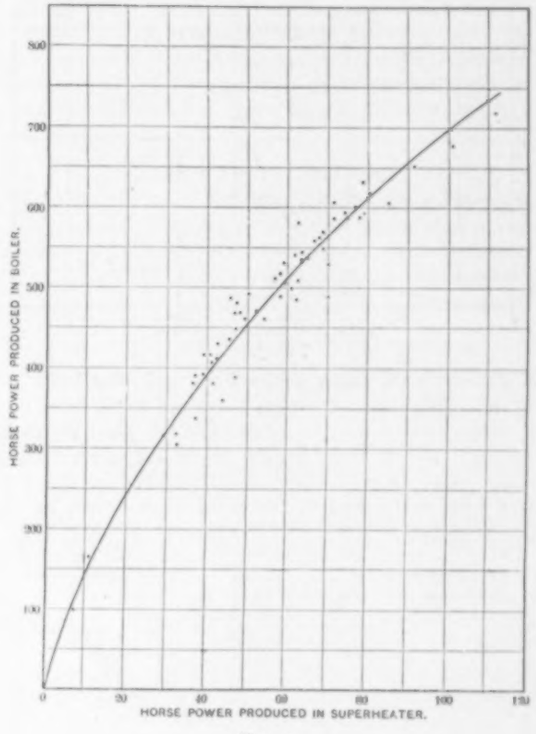

FIG. 2.

superheat to horsepower produced in the superheater. Fig. 4 shows percentage of horsepower produced in the superheater of that developed in the boiler.

With this apparatus all of the steam flows through the superheater under normal conditions, but as the safety valves are located on the boiler drums, surplus steam escapes without being heated, which tends to cause higher degree of superheat, because the rate of flow through the heater is reduced. With sudden drop in load, superheat with the apparatus in question, has been observed to rise to 350 degrees. It has been considered that under such conditions there is danger of damage to the superheater tubes from overheating. The author is not aware that such damage has been caused, but to prevent its occurrence, it has been considered desirable by some manufacturers to also locate a safety valve on the superheater which will discharge at a somewhat lower pressure than those on the boiler drums.

*Read at the Scranton meeting (June, 1905,) of the American Society of Mechanical Engineers.

One feature of this apparatus which has caused trouble, is the position of the safety valves, they being located just above the water baffle at the front of the boiler drums. Fig. 5 shows the front end of the drum. A is the outlet to the safety valve, B the so-called dry pipe leading to this outlet, C the water baffle. As will be observed, the steam and water from the

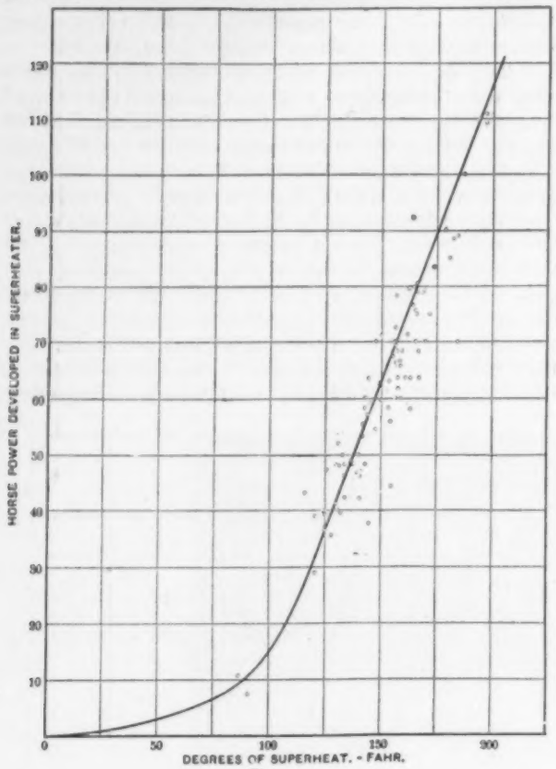

FIG. 3.

front headers of the boiler escape from under the baffle just below this safety valve dry pipe, there not being more than 18 in. between the normal water line and this pipe; the result is that water is very easily carried out by the steam escaping from the safety valve. Occasionally the water line has been reduced from the middle of the gauge glass to the bottom,

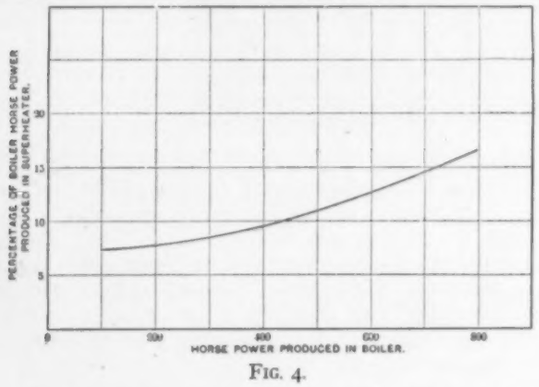

FIG. 4.

a drop of 6 in. occurring in a few seconds. Under such conditions temperature of superheat arose to 350 degrees. The water is indicated in Fig. 5 as rising to the safety valve pipe showing the manner of its escape.

Duplicate pipes D gather the steam and conduct it down through the bottom of the drums to the superheater which is located below. Fig. 7 is a cross section indicating these duplicate pipes, and Fig. 6 is a cross section at the safety valve. These so-called dry pipes are perforated on their upper surface with a very large number of holes of a diameter of about 0.25 in.

AMERICAN AND EUROPEAN MACHINERY IN MEXICO.

United States Consul A. J. Lispinasse of Tuxpam, Mexico, in his annual report comments upon trade possibilities as follows:

In view of Mexico's proximity to the United States, it seems strange that American machinery is not exclusively employed by all of the 14,000,000 to 15,000,000 Mexicans—mostly engaged in agriculture and mining—who have occasion to use machinery. On the contrary, they seem to prefer English and German makes, not on account of superior workmanship or cheapness, but apparently because European manufacturers are disposed to conform to their requirements. Furthermore, the Europeans extend long credits, which permit the buyers to proceed leisurely, in conformity with the slow methods employed here in every enterprise.

American machinery is admitted to be excellent, but it is not suited to the rough handling of the unskilled Indians and

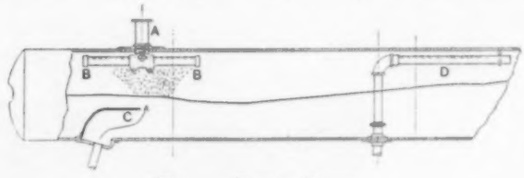

FIG. 5.—BOILER DRUM.

half-breeds, who, in majority of cases, perform all kinds of labor here. By most of these a machine is made to perform its duty, regardless of defects which may exist through faulty installation or other causes. The laborers do not stop to take these possibilities into consideration. They cannot appreciate the fine working parts of complicated machinery, nor the careful handling it demands. European machinery is fully one-fourth to one-half heavier than American machinery of the same power, and will stand much rough treatment.

Another source of complaint is that carelessness is displayed by American manufacturers in shipping machinery and

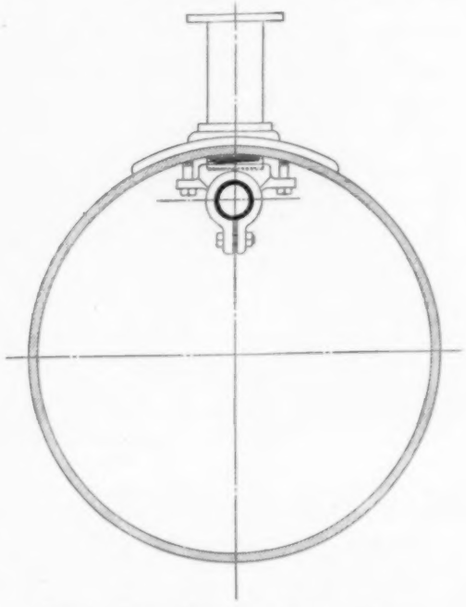

FIG. 6.—CROSS SECTION AT SAFETY VALVE.

accessories, which frequently arrive in very bad condition, requiring the missing parts to be replaced by native mechanics, who thereby jeopardize the working of the machines. The European manufacturer assumes no risk through irresponsible packers or assistants; his products are packed and shipped in a faultless manner, which satisfies his customers, who are

quick to appreciate all that this means to them, especially if they are located in some remote section where it is difficult to transport machinery and almost impossible to replace parts that are missing or broken.

By thoroughly canvassing this country American manufacturers will, no doubt, easily overcome these objections, and greatly increase the demand for their machinery of all kinds, which is, notwithstanding criticisms, already held in high esteem. There would be a large field for small motors, pumps, rams, etc., which could be applied to a variety of purposes, such as sawing wood, filling water tanks for stock, and running coffee fanners, cornshellers, decorticating machines, and small cane mills.

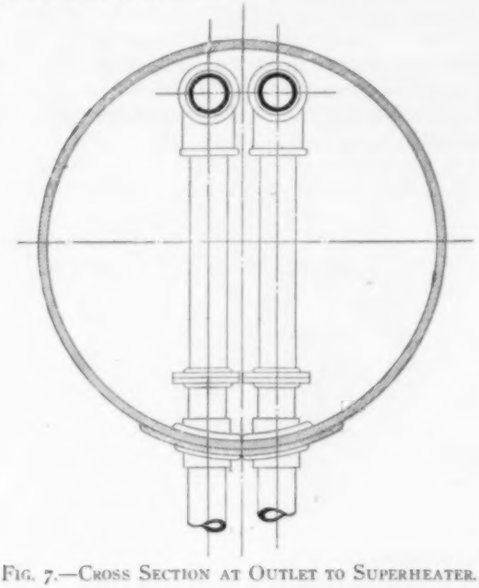

FIG. 7.—CROSS SECTION AT OUTLET TO SUPERHEATER.

In the more important industrial establishments, such as large sugar-cane plantations and stock ranches and mines, there is an unlimited field for the introduction of machinery and mechanical implements of all kinds, about which the average Mexican planter or miner has not the faintest idea, but which he would gladly utilize if brought to his notice by possessing sufficient practical mechanical knowledge to be able

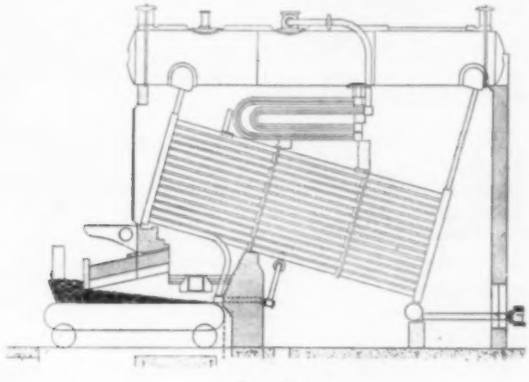

FIG. 8.

to demonstrate how the machine should be operated, so that the unskilled attendant could get a practical illustration of its working.

George J. Gould plans that the western terminus of his system shall be on San Francisco Bay on June 1, 1907. The specifications call for the construction of 850 miles of main line of the Western Pacific in the quickest time on record. Ground has not been broken as yet and no construction contracts have been let.

CHALMERS & WILLIAMS

Will Erect Plant for Making Mining Machinery at Chicago Heights.

Chalmers & Williams, 1553-55 Railway Exchange, Chicago, have purchased a tract of land 700 by 50 ft. on Chicago Heights and will erect a modern plant for the manufacture of machinery and supplies for railways, mine mills and smelters. The original plant will consist of the machine shop and foundry, 100 x 200 ft., a pattern shop, 42 x 42 ft., power plant, 75 x 42 ft., and a blacksmith shop, 75 x 42 ft. There will be sufficient grounds left to the north of the works, which is also owned by the company, to allow for such future additions as may seem justifiable. Chalmers & Williams will have as heads of departments, Knut Poste, for fifteen years with Fraser & Chalmers and Allis-Chalmers Co., in the mining sales department; Ralph Sprado, at present their consulting engineer, for twelve years with Fraser & Chalmers and at one time their chief draftsman; David G. Smith, who has recently resigned as superintendent of the Fraser & Chalmers' machine shop of Allis-Chalmers Co.; M. O'Conner, superintendent up to the day of his resignation from the Fraser & Chalmers foundry of the Allis-Chalmers Co.

The plant at the present time is being equipped with the most modern tools obtainable for the manufacture of mining machinery, to which the company will entirely confine itself. The shops will be entirely electrical driven, direct current being used, an individual drive on all machines where it is practicable.

Rails for the Isthmus.

The following letter from Col. Clarence R. Edwards, U. S. A., chief officer of the Isthmian Canal Commission is self-explanatory:

Isthmian Canal Affairs Office of Administration,
WASHINGTON, D. C., June 13, 1905.

Editor Iron Trade Review:

Sir:—I have the honor to acknowledge the receipt of your letter of the 1st instant, in which you state that you have noticed an item in an exchange to the effect that an inquiry has been addressed by me to Secretary Drake of the Panama Railroad Co., regarding the price paid for steel rails, and asking whether Mr. Drake's reply, as stated in the press, to the effect that he has convinced the manufacturers that Colon is foreign territory, and that rails for use in that territory were entitled to lower price than $28.00, charged to buyers in this country, is correct.

In reply you are respectfully informed that it is quite clear that as far as purchase of supplies is concerned, for delivery on the Isthmus, Colon and Panama are apart from the United States, and that the Isthmian Canal Commission has every right to expect the best export treatment in such purchases.

Mr. Drake reports that while the price of steel rails for home consumption, in the United States markets, has been practically uniform at $28.00 per ton for the last twelve months, exceptions to this price have been made where rails were sold in United States markets for export. The manufacturers gave the export prices to the Panama Railroad Co. as well as to the Commission. In June, 1904, 70-lb. steel rails were purchased at $22.75 per ton for first quality, and at $21.75 per ton for second quality, for export to Colon. Mr. Drake stated that at the same date the price for rails of foreign manufacture, delivered in bond f. o. b. New York, was $23.90 per ton, but that price was later withdrawn and advanced to $25.00 per ton f. o. b. New York, or 27.75 c. i. f Colon.

Very respectfully,
C. R. EDWARDS,
Chief of Office

The Lowenbach Machine Co., Milwaukee, has been incorporated by Frank Schlitz, Frank A. Anson and Hugo Lowenbach. The capital stock is $300,000.

THE PRODUCTION OF FLUORSPAR.

The use of fluorspar in foundry work and in steel making has increased the demand for this mineral, but no new deposits have been opened in this country during the last few years. Illinois and Kentucky still continue to be the chief source of supply for fluorspar. During 1904 the production of fluorspar was confined almost entirely to these states. A very small quantity was contributed by Arizona.

The total production of fluorspar in 1904 amounted to 36,452 short tons, valued at $234,755, as compared with 42,523 short tons, valued at $213,617 in 1903, a decrease of 6,071 short tons in quantity, but an increase of $21,138 in value. This greater value of the 1904 production is due to the comparatively greater quantity of ground fluorspar sold in 1904. Of the 1904 production 16,360 tons, valued at $81,331, were sold in the form of lump fluorspar, as compared with 30,338 tons, valued at $129,971, in 1903, a decrease of 13,978 short tons in quantity and of $48,640 in value; 15,421 short tons of ground fluorspar valued at $130,210, were sold in 1904, an increase of 10,186 tons in quantity and of $77,864 in value, as compared with 5,235 tons, valued at $52,346, sold in 1903. The remainder of the 1904 production, namely 4,671 tons, valued at $23,214, was prepared for market but not sold. It is still in the hands of producers. Adding it to the quantity sold brings the total quantity of lump fluorspar produced in 1904 up to 21,031 tons, valued at $104,545.

The average price a ton reported as received for the lump fluorspar was $4.97, which is 69 cents a ton more than the average price of $4.28 received in 1903; it is, however, 22 cents less than the average price of $5.19 a ton received in 1902. The highest price received for lump fluorspar in 1904 was $11.50 a ton, which was for the Arizona production; the lowest price recorded was $3.60 a ton, which was received for a small portion of the Kentucky product. The two extremes in price in 1903 for lump fluorspar were $11.50 and $3 a ton. The lump fluorspar imported into the United States affects the market considerably, especially when there is any decrease in the demand for this material.

The average price received for the ground fluorspar in 1904 was $8.44 a ton, a decrease of $1.55 as compared with the average price of $9.99 received in 1903, and a decrease of $1.54 as compared with the average price of $9.98 a ton received in 1902. The prices reported as having been received for the ground fluorspar varied from $8 to $10 a ton. The producers of fluorspar numbered 15 in 1904, as compared with 12 in 1903, and 18 in 1902. These were divided as follows: 1 in Arizona, 5 in Illinois, 8 in Kentucky, and 1 in Tennessee. Kentucky was again the state to have the largest output. Its production amounted to 19,096 short tons, valued at $111,499.

The above facts are taken from the report entitled "The Production of Fluorspar and Cryolite in 1904," which Dr. Joseph Hyde Pratt has prepared for the United States Geological Survey as a contribution to the annual volume "Mineral Resources of the United States." The Survey has recently published a professional paper (No. 36) entitled "Lead, Zinc, and Fluorspar of Western Kentucky," by Messrs E. O. Ulrich and W. S. Tangier Smith and a bulletin (No. 246) called "Zinc and Lead Deposits of Northwestern Illinois," by Mr. H. Foster Bain, which will appeal to those interested in the production of fluorspar. All three papers are published for gratuitous distribution and may be obtained on application to the Director of the United States Geological Survey, Washington, D. C.

The Reading Stove Works, of Reading, Pa., which has just completed the erection of an annex to its foundry and a large power house, has let the contract for a new engine and boiler house, to be two buildings in reality, and a bath house for its moulders and other employes. The buildings are to be of brick and are to be erected by Beard Co., of Reading.

COMPLETE CHANGE

In Policy of Passaic Steel Co.—Will Issue $1,000,000 Preferred Stock.

Niven McConnell, who was recently elected the vice president and general manager of the Passaic Steel Co., of Paterson, N. J., was on May 25 elected to the presidency of that company and already has plans under way for a complete change of the policy and operation of the works. To provide the necessary funds for carrying out Mr. McConnell's ideas, which include important changes in the arrangement of the mill and the addition of new works, the stockholders recently authorized an issue of $1,000,000 preferred stock.

Mr. McConnell is one of the best known practical steel men in the United States having been associated for a number of years with the Carnegie Steel Co. as superintendent of the open-hearth steel department of the Homestead works. Afterwards he built and managed the Sharon Steel Plant which was absorbed by the United States Steel Corporation. He was then engaged by W. H. Donner, representing the Flick and Mellon interests in the Union Steel Works at Donora, Pa., which were afterward absorbed by the United States Steel Corporation. It was while general superintendent of the plant at Donora that Mr. McConnell was engaged by the Passaic Steel Co.

Commerce With Cuba.

The monthly summary of commerce and finance issued by the Department of Commerce and Labor through its bureau of statistics presents the latest available statistics regarding the trade of the United States with Cuba for the ten months ending with April, 1905, as compared with the corresponding period of the preceding year from which it seems that our trade with Cuba both as regards imports and exports is for the present fiscal year the largest on record. Exports of iron and steel manufacturers, head the list with $5,061,396 for the 10 months ending April 30, 1905, as compared with $2,858,363 for the same period in 1904.

The 1905 item represents $403,127 for builders' hardware, $277,288 sewing machines and 208,381 for locomotives and numerous other items. The total exports to Cuba for ten months ending April 30, 1905, were valued at $31,319,520 a gain of 43.3 percent, while imports from Cuba in the 10-month period ending April 30, 1905, were $69,441,259, an increase of $12,717,819 or 22.4 percent.

The imports of iron ore from Cuba for the period under review, decreased from $993,298 to $757,912, while the exports to Cuba of bituminous coal increased from $1,122,523 to $2,280,479.

Ambrose Swasey Honored.

As a fitting climax for the commencement exercises of the Case School of Applied Science, held in the auditorium of the electricity building, on the college grounds, Cleveland, President C. S. Howe awarded the honorary degree doctor of engineering on Ambrose Swasey, of Warner & Swasey, Cleveland, formerly president of the American Society of Mechanical Engineers. The degree was conferred with the following compliment: "Ambrose Swasey, designer and builder of the largest telescopes in the world, manufacturer of precise astronomical instruments, maker of fine and accurate machines for the promotion of applied science, eminent mechanical engineer, honored by engineering societies at home and abroad, in accordance with the vote of the faculty and by authority from the board of trustees, in the name of Case School of Applied Science I confer upon you the degree of doctor of engineering."

Ernest M. Loeb has purchased the plant of the Consumers' Ice Co., of New Orleans, La., and expects to erect a large foundry and iron works on the site.

COCHRANE FEED-WATER HEATERS

That non-condensing engine of yours utilizes less than 10 per cent. of all the heat in the steam supplied to it. Do you utilize the remaining 90 or 95 per cent. of the heat, or as much of it as possible?

One way to utilize the heat is to install a Cochrane Feed-Water Heater, for the heater will immediately conserve and put back into your boiler, under the adverage conditions, about 15 per cent. of the waste heat, or more than the engines utilize. This means a saving of 15 per cent. of your entire fuel bill—a saving that will pay for the Heater in a few months.

Or instead of making this fuel saving, you can correspondingly increase the steaming capacity of your boilers without increasing your present fuel consumption. In this way the equivalent of an extra boiler can frequently be obtained or the same work done with one less boiler.

But besides that there's the **purification** of your boiler feed water to be considered. No matter how bad the water may be a Cochrane Heater will materially improve it, helping to keep your boilers free from scale and preventing pitting and corrosion.

Again, by feeding hot water to your boilers a Cochrane Heater will eliminate severe contraction and expansion strains and greatly prolong the life of the boilers.

We have hundreds of letters from users telling of the "excellent work," "perfect satisfaction," "admirable service," that our Cochrane Heaters are giving.

May we have the opportunity of taking up the subject of heaters with you?

Our Catalogue 11-H is free for the asking.

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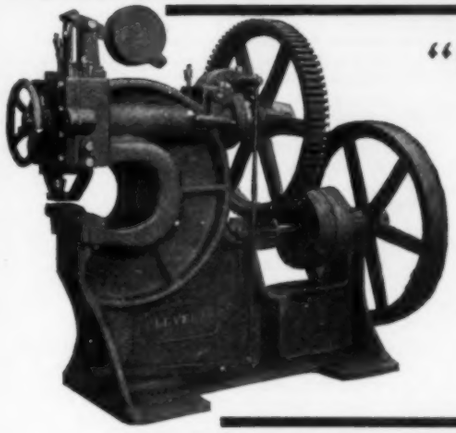
Manufacturers of Cochrane Feed-Water Heaters, Cochrane Steam & Oil Separators and the Serge-Cochrane Systems.



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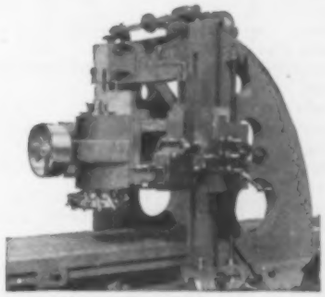
You have a stationary tool on your planer, why not have a revolving tool, also?

The Farwell Miller is a big cost cutter on a lot of that work that is finished all over.

Vertical, horizontal or angular spindle. Four sizes. Send for Catalog No. 55.



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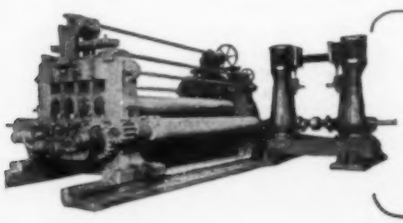

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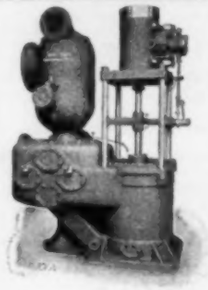

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United Engineering & Fdy. Co., Pittsburg, Pa.
The Wellman-Seaver-Morgan Co., Cleveland.
R. D. Wood & Co., Philadelphia, Pa.
Youngstown Engineering Co., Youngstown, O.

Crucibles—
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Hill & Griffith Co., Cincinnati, O.
The S. Obermayer Co., Cincinnati and Chicago.
J. W. Paxson Co., Philadelphia, Pa.
The J. D. Smith Fdy. Supply Co., Cleveland.

Crushing Machinery—
C. O. Bartlett & Snow Co., Cleveland, O.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Farrel Fdy. & Mach. Co., Ansonia, Conn.
Interstate Engineering Co., Cleveland, O.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Machinery Co., Chicago, Ill.
McLanahan-Stone Mach. Co., Hollidaysburg, Pa.
Mesta Machine Co., Pittsburg, Pa.
R. S. Newbold & Son Co., Norristown, Pa.
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The Wellman-Seaver-Morgan Co., Cleveland, Ohio.

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The Meehan Boiler & Construction Co., Lowellville, O.
Northern Engineering Works, Detroit, Mich.
The S. Obermayer Co., Cincinnati and Chicago.
J. W. Paxson Co., Philadelphia, Pa.
Riter-Conley Mfg. Co., Pittsburg, Pa.
Russel Wheel & Fdy. Co., Detroit, Mich.
The J. D. Smith Fdy. Supply Co., Cleveland.

Cutters—
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The Cleveland Twist Drill Co., Cleveland, O.
Pratt & Whitney, Hartford, Conn.

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Cleveland Punch & Shear Wks. Co., Cleveland.
The W. P. Davis Mach. Co., Rochester, N. Y.
Espen-Lucas Machine Wks., Philadelphia, Pa.
Hurlburt-Rogers Machine Co., South Sudbury, Mass.
Pratt & Whitney Co., Hartford, Conn.
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Vandyck Churchill Co., New York City.

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Pratt & Whitney Co., Hartford, Conn.

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Vilter Mfg. Co., Milwaukee, Wis.

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New Britain Machine Co., New Britain, Conn.
Pratt & Whitney Co., Hartford, Conn.

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The Electric Controller & Supply Co., Cleveland, O.

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Morgan Construction Co., Worcester, Mass.
Hugh L. Thompson, Waterbury, Conn.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
Watson-Stillman Co., New York City.

Drilling Compound—
Peerless Drilling Compound Co., Utica, N. Y.

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Bickford Drill & Tool Co., Cincinnati, O.
Cleveland Punch & Shear Wks. Co., Cleveland.
The W. P. Davis Mach. Co., Rochester, N. Y.
The William E. Gang Co., Cincinnati, O.
J. J. McCabe, New York City.
Mechanics Machine Co., Rockford, Ill.
Niles-Bement-Pond Co., New York.
Chas. G. Smith Co., Pittsburg, Pa.
Vandyck Churchill Co., New York City.

Drilling Machines (Upright)—
Baird Machinery Co., Pittsburg, Pa.
Baker Bros., Toledo, O.
Bickford Drill & Tool Co., Cincinnati, O.
P. Blaisdell & Co., Worcester, Mass.
Cincinnati Machine Tool Co., Cincinnati, O.
Cleveland Punch & Shear Wks. Co., Cleveland.
Knecht Bros. Co., Cincinnati, O.
J. J. McCabe, New York City.
Niles-Bement-Pond Co., New York.
Chas. G. Smith Co., Pittsburg, Pa.
Vandyck Churchill Co., New York City.

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Green Fuel Economizer Co., Mattewan, N. Y.

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J. G. Speidel, Reading, Pa.

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Norton Emery Wheel Co., Worcester, Mass.
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Amsler Engineering Co., Pittsburg, Pa.
David Baker, Philadelphia, Pa.
Victor Beutner, Pittsburg, Pa.
F. A. Coleman, Cleveland, O.
The Duff Patents Co., Pittsburg, Pa.
John Eichleay Jr. Co., Pittsburg, Pa.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Garrett-Cromwell Engineering Co., Cleveland.
R. M. Haseltine, Columbus, O.
S. V. Huber & Co., Pittsburg, Pa.
Robt. W. Hunt & Co., Chicago, Ill.
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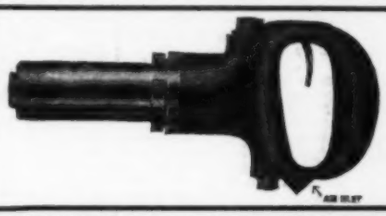

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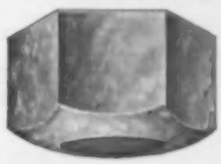

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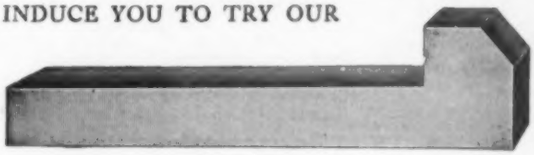

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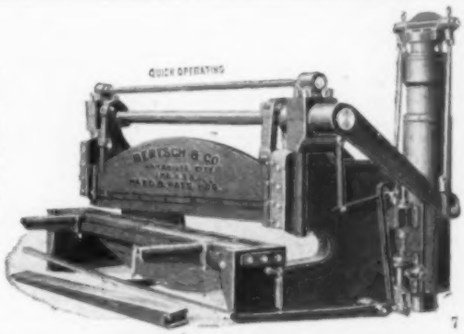

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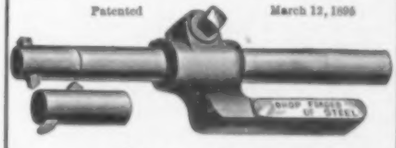

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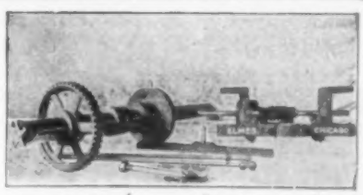

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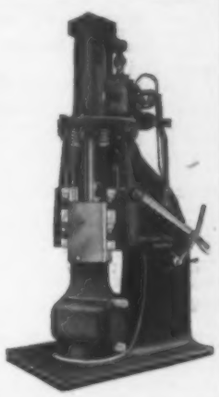

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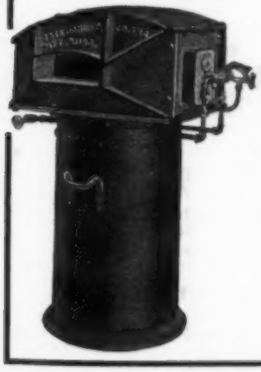

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The J. D. Smith Fdy. Supply Co., Cleveland.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
The Wellman-Seaver-Morgan Co., Cleveland, Ohio.

Tubes—
Bourne-Fuller Co., Cleveland, O.
S. Fix's Sons, Cleveland, O.
Globe Rolling Mill Co., Cincinnati, O.
National Tube Co., Pittsburg, Pa.
Joseph T. Ryerson & Son, Chicago, New York and Pittsburg.
Scully Steel & Iron Co., Chicago, Ill.
Shelby Steel Tube Co., Pittsburg, Pa.

Tube Welding—
S. Fix's Sons, Cleveland, O.

Tumblers—
The Adams Co., Dubuque, Ia.
The Globe Mach. & Stamping Co., Cleveland, O.
Hill & Griffith Co., Cincinnati, O.
Northern Engineering Works, Detroit, Mich.
The S. Obermayer Co., Cincinnati and Chicago.
J. W. Paxson Co., Philadelphia, Pa.
The J. D. Smith Fdy. Supply Co., Cleveland.

Turnbuckles—
Bourne-Fuller Co., Cleveland, O.
Cleveland City Forge & Iron Co., Cleveland, O.
A. G. Hathaway & Co., Cleveland, O.
New Jersey Fdy. & Mach. Co., New York City.
Republic Iron & Steel Co., Chicago, Ill.

Twist Drills—
The Cleveland Twist Drill Co., Cleveland, O.
The Whitman & Barnes Mfg. Co., Chicago, Ill.

Vises—
Hanna Engineering Works, Chicago, Ill.
Merrill Bros., Brooklyn, N. Y.
Wyman & Gordon, Worcester, Mass.

Washers—
American Iron & Steel Mfg. Co., Lebanon, Pa.
Avery Stamping Co., Cleveland, O.
A. G. Hathaway & Co., Cleveland, O.
Milton Mfg. Co., Milton, Pa.
Upson Nut Co., Cleveland, O.

Water Softening Plants—
Harrison Safety Boiler Works, Philadelphia.

Well Drilling Machines—
American Well Works, Aurora, Ill.

Wire (Cable and Rope)—
Lidgerwood Mfg. Co., New York City.

Wire Nail Machinery—
National Machinery Co., Tiffin, O.

Wire Rope Coating and Filler—
Ironsides Co., Columbus, O.

Wrenches (Machinists' Drop Forged, &c.)—
Whitman & Barnes Mfg. Co., Chicago, Ill.

THE BANQUET SCENE AT THE AUDITORIUM, CHICAGO, IN HONOR OF THE LAUNCHING OF THE
LAKE ORGANIZATION OF THE UNITED STATES STEEL CORPORA

SUPPLEMENT TO
THE IRON TRADE REVIEW
JUNE 29, 1905

OF THE GREAT STEAMER WILLIAM E. COREY, BUILDING FOR THE PITTSBURG STEAMSHIP CO., (THE CORPORATION), AT THE YARD OF THE CHICAGO SHIP BUILDING CO.